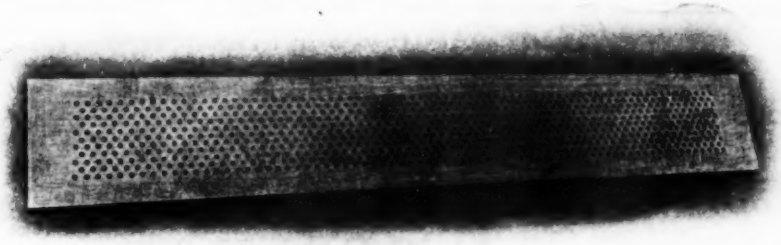
Wood Suction Box Covers



To the Paper Mill Manager

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Vol. 3—No. 7

THE PAPER INDUSTRY

A. SCOTT DOWD
Editor

A MONTHLY EDUCATIONAL JOURNAL
Devoted to the Interests of the Pulp and Paper Industry

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Back to Normal

A SHORT time ago the manager of one of the largest and best known companies in this country was asked if he expected that they would soon be back to normal conditions. "Back h——," he is reported as replying, "this company never goes back. We always go forward."

There has for a long time been talk about going back to normal, or back to old conditions, but it is questionable whether we could ever get back to the same old conditions that existed before the war if we wanted to. The war has so changed the conditions and thought in this country, and has brought out so many things that we never thought of before, that possibly none of us would be satisfied if we were back to those same conditions. But the idea expressed by the above mentioned gentleman is worthy of emulation.

We all want to go forward, and not back.

Several days ago one of the prominent paper manufacturers was asked to fill an order in a hurry, as the customer thought this mill, as well as others, needed business badly, and was surprised to be told the mill had orders to keep them hard at it for sixty days, and we find in looking around that conditions among the mills are showing a wonderful improvement over those of a month or two ago. This is going forward, and not back.

The record of another large nationally known company, might well be told here. This company is spending a large amount of money in advertising this year, much more than last year. They report that the total volume of sales, in dollars and cents, is less than last year, but that the number of orders is materially increased. This company is getting stronger every day with its customers and making many new ones, and is again increasing its advertising over what they have been doing. Many of this company's competitors cut down on their advertising, while this company increased theirs, and it is each month showing a larger percentage of increase in orders over its nearest competitor.

We are told they intend to keep this up, and they are positive that the advertising being done now will ensure an enormous business for them for 1922 and 1923. They believe that the best insurance for business now, for next year and the following years, is to spend more money now than ever on their publicity.

There are many signs that point to better business, and among these are the fact that stocks of paper on hand by jobbers and printers, is very low.

Another sign is that farmers are marketing their crops promptly this year, providing them with spending money, and this condition helps the paper manufacturer, as well as all other classes of industry.

The railroads are getting hold of more money, some from the government, while their incomes are greatly in excess of what they had been up to a short time ago, and they are placing large orders for repair work and for improvements.

Interest rates on money is declining, and a sufficient supply of credit is becoming available for all sound business uses.

Unemployment is getting less and prices are stabilizing. Reports show that the retail trade in all lines is improving in rural sections of the country, as well as other sections.

The iron and steel industries are showing considerable improvement in the last month, and this is considered a very reliable barometer of business conditions.

Taken altogether we believe there has been a great improvement during the past month, and feel that the next thirty days will show as much or more improvement than the past thirty.

Let us all forget to talk further about going "back" to anything, but let us all look and go "forward," and if each one does his part we will soon be "forward" to good times.

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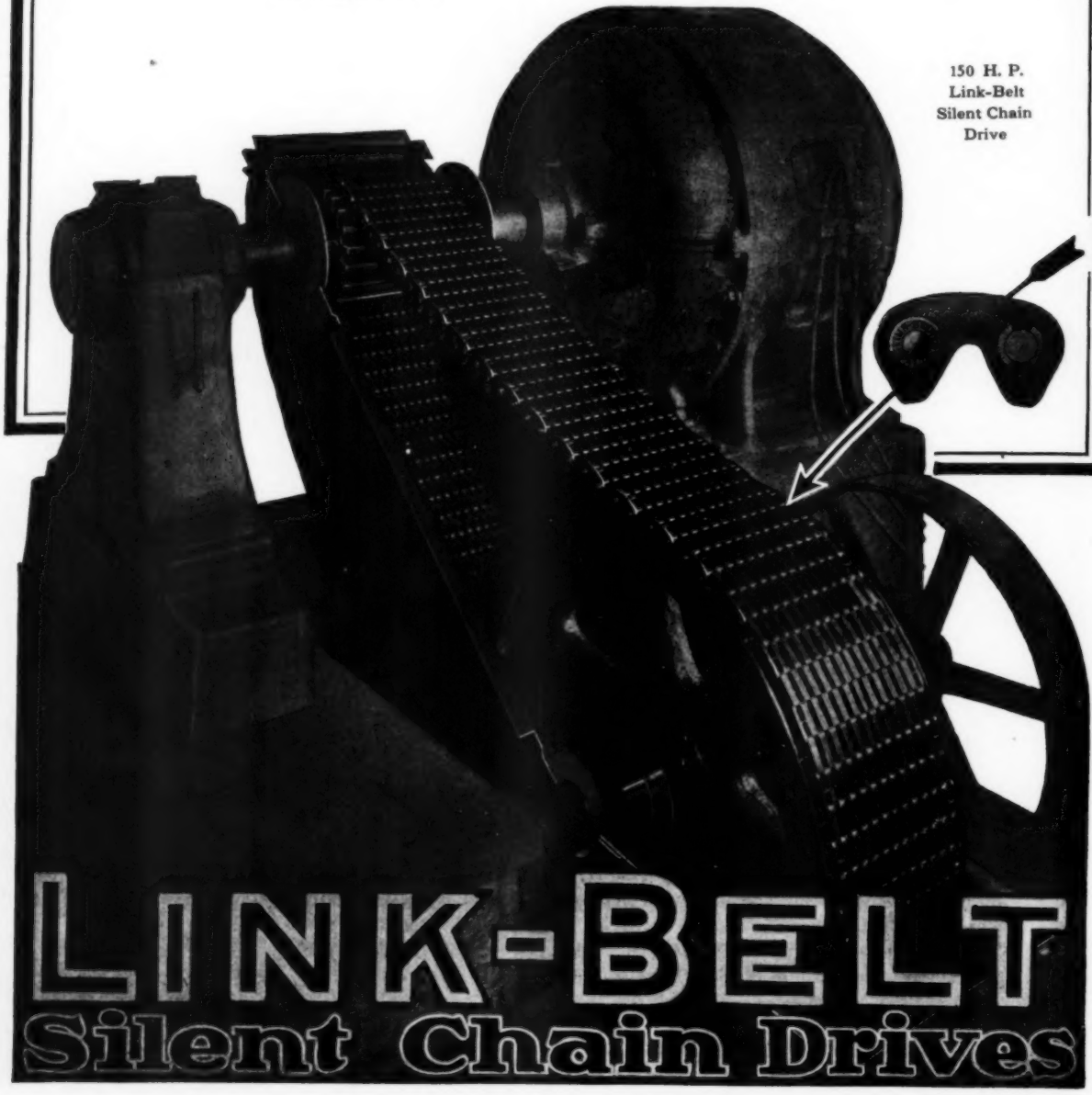

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LINK-BELT

Silent Chain Drives

In a Few Weeks—Winter

The melancholy days have come,
The saddest of the year,
Of wailing winds and naked woods,
And meadows brown and sear.
Deep in the hollows of the grove,
The withered leaves lie dead;
They rustle to the eddying gust,
And to the rabbit's tread.
The robin and the wren have flown,
And from the shrub, the jay;
And from the wood top calls the crow,
Through all the livelong day.
—*William Cullen Bryant.*

ALL signs point to a severe winter is the edict that has gone forth from prophets, would-be prophets, and sons of prophets, as well as daughters, and other prognosticators, and while we know most of these do not know what they are talking about, we do know that most winters are sufficiently severe to make us all sit up and take notice.

The point of all this is: How far have we all made preparations for the coming winter? Farmers say the squirrels are laying up more than their usual store of nuts and other foods for winter, and that the fur on certain animals is heavier than usual. If these things are true, then most of the animals have more sagacity than many people.

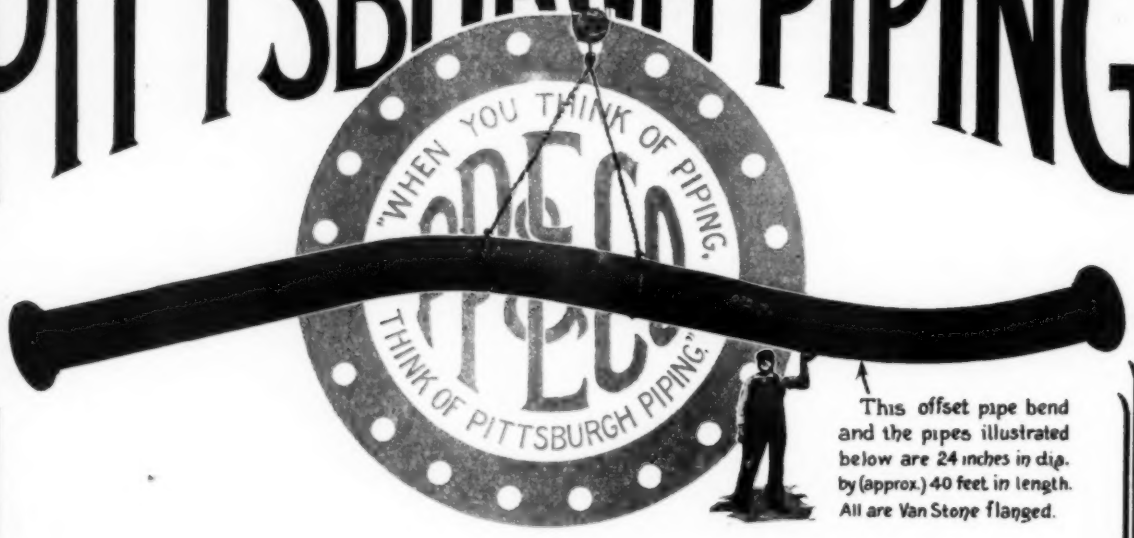
The writer has in mind many visits to many paper mills in winters gone by, and there he noted many depleted coal piles, with plants ready to close down for lack of coal, simply because due diligence had not been exercised in laying in stores of coal in the summer or fall of the year. There is no better asset for the average paper mill than to have a big storage pile of coal when the snow begins to fly. We have written on this subject a number of times, and have been pleased to know that many mills followed our advice and put in coal storage and proper coal handling equipment, but many of the mills continue to travel in the same old rut. To these we want to say, store all of the coal possible, and if you do not have proper handling equipment get in touch with some manufacturer NOW, and have this necessary work done.

A short time ago the writer called at one of the large paper manufacturing companies, and noted that while a considerable part of their plant was doing very little in the way of filling orders, many men were busy around the plant, and these men, according to the management, were getting everything ready to fill orders on a one hundred per cent production whenever the orders came in. At another large plant in the same territory it was found that while one of their mills had been idle since the first of the year, and while the plant needed considerable in the way of repairs, there had not been one cent spent in repairs, for, as the management is reported to have said, "It was no use to spend money on repairs until orders came in." This, of course, is poor logic, as well as poor business. The proper time to rebuild and make repairs is when the plant is not busy on orders, and then, as the first mentioned management figured, when orders come they will be ready to fill them.

The old argument as to whether it is profitable to spend money when little is being made has been discussed pro and con for so many years that it is moth eaten, but there is no denying the fact that the best way to keep a good customer is to fill his order as soon as received, and the only way this can be done is to have the plant in good shape.

In a few weeks—winter. The squirrel lays in his store and other animals prepare for what they know is coming. Why not take a lesson from these and lay in stores of coal and put the plant in shape before the cold and disagreeable weather comes?

PITTSBURGH PIPING



This offset pipe bend and the pipes illustrated below are 24 inches in dia. by (approx.) 40 feet in length. All are Van Stone flanged.

Piping is an important factor in safeguarding continuous and economical manufacturing.

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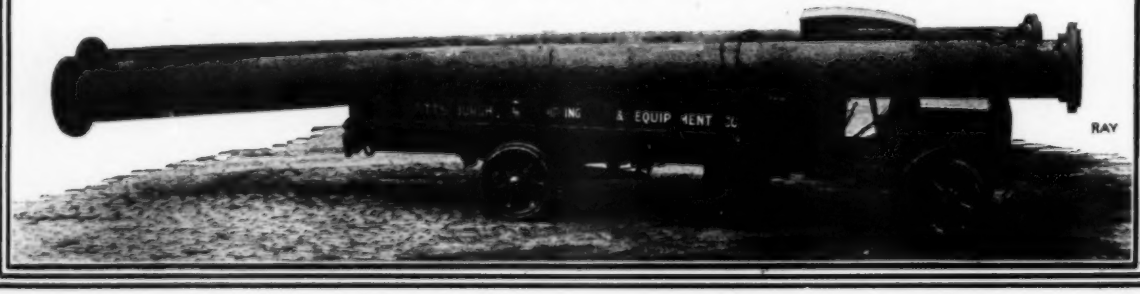

What Is Worth While

By R. L. S.

TO STRIVE and toil for material aggrandizement, to fight for appearances, to seek to electrify rather than purify and pacify the world is mere ambition, leading towards that state of human flux which lives like fluttering meteors, dies like a burnt out fire and ultimates in ashes of tactless achievement.

I would rather be the dimmest star that shines
Than the blazing meteor, wasting its substance in space.

It is a great thing to be alive and a part of the world struggle of today, but it is a greater thing where one has gained something of what it means to work out the problem of existence and reach a correct answer.

Service is the cry of the hour. This is still being prostituted, however, by that section which estimates the self-service idea a legitimate prop to the extent that they are walking leeches upon all about them, putting forth no generous effort to benefit others, but forever like sponges absorbing the honey of earth, giving a return only when squeezed.

The science about everything is all there is to anything. When we understand this we shall know that there are not two paths to success, nor is there more than one ladder reaching heaven.

If moral science is necessary in our schools, musical science a demand in instrumental accomplishment, mechanical science essential in factory progress, and mathematical science needed in mental processes, then the man who is seeking to bring out "what is worth while" in life must be alert to the pitfalls that confront him leading to disregard of his own best interests.

The science of service is to forget yourself in the service of others. A man who cries "Service" while seeking to serve himself has a wrong angle upon the term, and one which will in the end defeat his highest hope.

Suppose every man were to start out tomorrow morning determined to help others to do things for people rather than to **do people**, TO GIVE RATHER THAN TO GET. We should still have as much money in circulation, as much need of business activity, but in so different a spirit should we struggle that the needy places of earth would be quickly smoothed over.

Whether in flowers or folks, life is normally radiant, not absorbent. That individual who absorbs without giving back, who serves himself of others, who PRAYS for PREY, needs to forget self and learn the joy of service that is something besides a camouflage for hidden, selfish intent.

I seldom see the clothes you wear,
I scarcely hear your voice;
But what you count
As well worth while,
This is yourself,
If gross, or choice.

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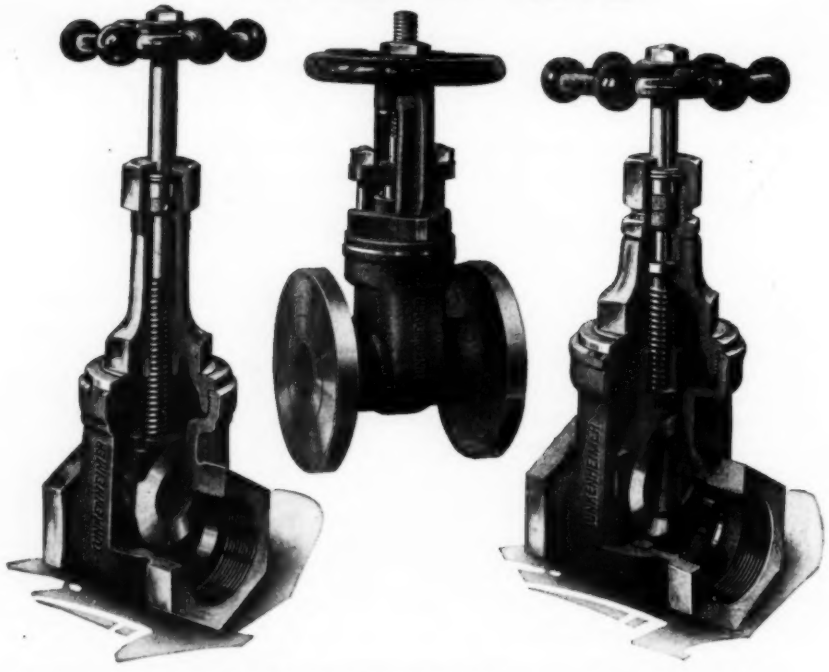

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Business Sense

By IKE KENNEDY

Good Will

THE street Fakir doesn't have to be overly conscientious about the quality of goods he offers us. His stock in trade consists of what he is pleased to style cleverness. The louder he barks the better we like him. He puts us under his spell for the moment, gets our money and vanishes. That's the advantage of being able to move fast enough to select new suckers at every cross-road. He has his limitations however, he works hard and works fast for what he gets; so does the Porch Climber. Have you ever seriously thought about that big asset known to business as Good Will? We used to hear a lot about it years ago. It appeared in every transfer of business property. It was about the most important thing about the place. Our fathers and grandfathers banked on it. They traded on it when money was hauled to town in the shape of cord wood, and a big copper two-cent piece was just as big and quite as influential in the community as a quarter. A ten-cent feed barn and a bag of cheese and crackers constituted a real devil take it spend thrift. You didn't have to have money —there wasn't any—but you did have to possess a reputation for honest and square dealing, and confidence was the medium of exchange. Those good old home spun rules of business haven't lost one particle of their value as applied to present-day business, and the fellow who has lost sight of these principles has lost sight of the real key to business success. We don't see many of those old signs "Established in 18—" and we ought to see more of them! They had a meaning—they would mean something today. They mean that particular business has thrived and flourished all these years by sticking to certain well founded principles of honesty and fair dealing. You don't have to be a merchant to bear one of these signs over your doorway. What are you as an accountant, a machinist, a salesman, a clerk or an ordinary day workman that you can write over your door something to be proud of? How are you equipped; what is your standard of fair dealing; what sort of a name and Good Will are you going to pass along to that son of yours, who can have no better heritage than the good name you have handed down to him?

Laziness

SOME fellow has said, "We are all just as lazy as we can afford to be." We wonder if there isn't some truth in that statement. It takes times like these to show us up in our true light, for just about the time we begin to settle down like the contents of a well brewed jar of Hootch we have to be bottled or we get sour. Take, for example, the fellow who has always worked on a salary. You won't always find him lazy, but you will find that he has surrounded himself with short-cut, labor-saving devices as ridiculous and insane as ever connected in the senseless cartoons of Rube Goldberg.

This same salaried chap gets it in his noodle that the world cannot do business without him, and just for that he has challenged the boss to fire him, and the boss does fire him and the world goes on.

Once upon a time an old German was conducting a grocery business. He had in his employ a bright young chap who had grown up with the business. This fellow thought himself responsible for its development and continuance. One day he struck the kindly old German for a raise in pay. The old man explained honestly that business would not warrant it, but the boy insisted and argued that the business would go to pieces without him.

Strange enough the old man had always thought the same thing—he hated to lose the boy. He saw visions of his business following the boy. Then the boy produced the argument: "Have you ever considered what would become of this business if I were to die?" Here's where the old man wakened up and exclaimed, "No by gimminie crickets; say, you just consider yourself dead." This little resolution actually did two things for business. It required the old man to shake himself from retirement; also was the means of injecting new blood into the institution that had gone stale and become self satisfied. Secondly, it required the other fellow to put into action some of the experience he gained from the old man.

The result was the development of two stores where but one had barely flourished. It developed competition and showed up for the first time the natural laziness that had existed in both parties. We need a good shake down some times to bring out latent talents. We need to be caught in a pinch to jar us into our sensibilities. If ideals are the lash of God to spur us on to accomplishment, we need just such liberation, however harsh, to shake us loose from our natural inborn laziness and self conceit.

God give us power to see,
And strength to meet our destiny.
Lead us, yea, drive us if we pause,
Or falteringly forsake the cause.

Remove the cast which blinds our way.
Fill to the brim this darkened day
Our souls with hope, our hearts with joy.
Cast out all doubts we now employ.

Keep us out of the Slacker class,
Raise us above the quitting mass,
Give us the power to do or die,
Grant us at least the will to try.

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Principles and Practice of Bleaching

By E. SUTERMEISTER

THE object of bleaching as applied to paper stock is the production of a better colored fiber for the manufacture of white paper. The agents which may be employed in bleaching are practically all of an oxidizing nature and among them may be mentioned chlorine gas, hypochlorites, hydrogen and sodium peroxides, permanganates, etc. Chlorine gas offers certain advantages, particularly in the removal of shives and metallic particles and in discharging iron mordanted colors from rags, but it is difficult and disagreeable to handle and is very seldom used. The peroxides are not very efficient bleaching agents where wood pulp is concerned and they are too expensive for general use. Permanganates are also too expensive but they differ from hypochlorites in not attacking the cellulose so strongly and for this reason they have been recommended in certain special cases. Practically, therefore, hypochlorites, and more especially calcium hypochlorite, are the only bleaching agents of any importance in the paper industry and the following remarks apply to these agents only. It is assumed that the preparation and properties of bleaching powder and its solutions are sufficiently well known to need no discussion here and this paper will therefore be confined to the principles and practices underlying their practical use.

Different Bleaching Methods

Bleaching is carried out by two different methods; in one a distinct excess of the bleaching agent is used and when the correct color is reached the excess is removed by washing, while in the other the bleach added is only that which will give the desired shade and the operation is concluded when the bleach is practically exhausted. This accounts, to a considerable extent, for the differences of opinion of different experimenters and for the varying results which they obtain, for the method employed has a marked influence upon the results.

Important Factors—Concentration

Among the factors influencing bleaching, two of the most important are the concentration of the stock and its temperature. The former is of particular importance when an excess of bleach is added and the unused part removed at the end of a given time. Under these conditions increasing the concentration increases the rate of bleaching very greatly. Experiments by the writer showed that one sample of fiber used up 13 percent of bleach in about 22 hours when at a concentration of 0.7 percent, and in 15 hours when the concentration of fiber was raised to 4.35 percent. Increasing the concentration still higher still further hastens the bleaching action, a sample of similar fiber bleaching in 75 minutes at a concentration of 18 percent, though the temperature was rather lower than in the previous case. Similar conclusions have been reached by Spence, who found that 10 percent of bleach was used up in 8¼ hours at a concentration of 3 percent and in 3½ hours when the concentration was 7½ percent.

The effect of concentration upon the color produced when a certain amount of bleach is added and allowed to exhaust is not so definitely established. Spence, working on soda poplar fiber found that increasing the concentration gave a slightly whiter fiber, while the writer's work on sulphite shows that at densities of 0.7 to 4.35 percent, the concentration is practically without effect, while raising it to 18 percent gives a fiber of slightly poorer color. It appears that even very wide changes in concentration cause such small variations in color that they could be corrected by adding or subtracting, at most, 0.5 percent of bleach on the weight of the fiber.

The effect of concentration of bleaching upon the amount of dirt remaining in the bleached fiber has recently been investigated using three samples of sulphite fiber and comparing the results of bleaching at 2 percent and 18 percent concentration. The particles of dirt and the shives were counted by two different observers and wherever any marked difference could be observed it was in favor of that bleached at 2 percent which showed less dirt and fewer shives.

Temperature

The temperature factor is one which has a very great influence on the bleaching results and all observers are agreed that raising the temperature greatly shortens the time of bleaching. The following table shows the results obtained by Spence on soda poplar using 10 percent of bleach.

	Concentration of stock in percent			
	5	6	7	7½
Temperature degrees F.	Hours to exhaust bleach			
108-110	7	6¼	5½	5
118-120	5¾	4¾	4	3½
128-130	3¾	3	2½	2¼
143-145	2¼	1¹³/₁₂	1⅞	1½

It appears from this that the effect of a given increase in temperature depends to a certain extent upon the concentration of the stock. Similar tests on sulphite spruce have proved that to exhaust a given amount of bleach at 105° F. requires eight to nine times as long as it does at 150° F.

When it comes to a question of the effect of temperature on the color produced there is again more or less difference of opinion. Cross and Bevan state that esparto bleached at 32° to 39° F. uses only 80 percent of the bleach necessary at 95° F. to give the same color. Simonsen, working with sulphate pulp found

that at 55° F. 7 percent of bleach was sufficient but that at 95° F. the same color could only be produced with 9 percent of bleach. Experiments by the writer give indications in the same direction, but the difference in color between samples bleached at 68° and 156° F. was only such as could be corrected by increasing the bleach by about 0.5 percent, based on the weight of the fiber, or approximately 5 percent of the bleach necessary for an easy bleaching fiber. Spence's results on soda fiber show that up to about 120° F. increasing the temperature improves the color but beyond this point the color becomes poorer. In his tests the lowering of color between 120° and 145° F. would represent the change produced by about 0.7 percent of bleach based on the fiber.

There is evidently no hard and fast rule regarding the maximum temperature which may be employed in bleaching, and it is largely a question of personal opinion on the one hand and the type and capacity of the plant on the other. It might very well be possible that under certain conditions it would be better to raise the temperature of bleaching and sacrifice a little bleach and steam rather than go to the expense of increasing the size of the bleaching equipment in order to obtain the increased product. This conclusion is strengthened by the fact that different authorities set the best temperature for bleaching at such widely differing points as 68° and 120° F.

These two factors, together with the amount of bleach added, are the ones upon which the bleach plant superintendent depends for the control of his process. There are however a number of things which greatly affect the bleaching results and to which he should pay considerable attention, especially if he is also in charge of the pulp making processes.

Other Important Factors

In either the acid or the alkaline process the nature of the wood used and the completeness of its cooking greatly affect the results obtained in the bleach plant. If variations occur in the wood, in the strength of the cooking liquor, in the method of cooking, or in the completeness of washing, then irregular results are almost certain to follow in the bleaching plant. This is especially true in the case of the sulphite process and to a less extent in the soda process because the more drastic treatment of the latter tends to take care of wider variations in materials or procedure. If the bleach plant superintendent is not also superintendent of the pulp mill then there should be the closest possible co-operation between the two so that any variations in the cooking process may be known before the stock reaches the bleach plant and causes trouble.

Water Used

Of the miscellaneous factors just mentioned, a discussion of the variations in wood, cooking liquors or methods of cooking would be out of place in this article but the problem of the completeness of washing of the stock and the nature of the water used may well receive a little attention. Considering first the nature of the water itself, apart from any possible contamination with the waste liquor from the cooking, it is evident that any oxidizable material present will use up more or less bleach. Such materials may be present because of contamination of the source of supply with sewage or wastes from manufacturing plants located further up the stream, or it may be derived from decaying vegetable matter. The amount of such impurities, or their bleach consuming power, can only be found from a careful investigation of each individual case, but the results of one such investigation may be of interest.

The supply in question was obtained from a comparatively short river flowing through very little swampy land and not very heavily contaminated with sewage or manufacturing wastes. Its waters were normally soft and quite low in color. Two tests on this water, taken after it had passed a sand filter, showed that each 1000 lbs. would use up 0.127 lbs. of 35 percent bleach. This appears to be a small item, but if the bleaching is conducted at a concentration of 7 percent it means 3.4 pounds of bleach per ton of fiber, while if the concentration is only 3 percent the bleach used by the water amounts to 8.2 pounds per ton. At 2c per pound for bleach this means that it costs from 6.7 to 16.4 cents to bleach the water used with a ton of fiber. For a plant bleaching 100 tons per day for 300 days per year this costs from $2020 to $4920, according to the bleaching system used. While this cost can hardly be avoided, it indicates one advantage of bleaching at high concentration.

Effect of Incomplete Washing

In addition to the regular water supply there is the possibility that some waste liquor may find its way into the bleaching system with the fiber. In fact, it is rare that the water entering with the fiber requires as little bleach as the water already described, and in some cases it may require very much larger amounts. Tests extending over six months at one sulphite mill showed that the water entering the bleaching system with the fiber required from 0.215 to 0.805 lb. of 35 percent bleach with an average of 0.425 lb. for 1000 lbs. of water. Substituting this figure in the former calculation, it is found that if all the water used is of this average quality, in handling 100 tons of fiber there will be expended from $6770 to $14690 per year for bleaching water. If river water could be completely substituted for this water, an annual saving of $4750 to $9770 would result. Here again this trouble cannot be entirely avoided but close watch should be kept to see that the unbleached fiber is washed as completely as possible. If this is not done very considerable variations may occur in the color of the bleached pulp, for occasionally there is enough waste liquor present in the fiber to use up bleach equivalent to 6 to 8 percent of the weight of fiber.

Similar tests have been made on the water accompanying soda fiber, and for an average it was found that 1000 lbs. of water used up 0.192 lb. of bleach above the amount required by the filtered river water at the same time. Evidently strict attention is needed in the soda as well as the sulphite process.

Use of "Back Water"

While discussing the question of water mention should be made of the use of "back water" or the water containing small amounts of bleach which has been removed from the bleach fiber. The use of such water in furnishing up the breaking engines is quite common, especially in plants which add more than the necessary amount of bleach and then remove the excess. Tests upon samples of such water have shown that the organic matter present either in solution or suspension continues to use up bleach and thus causes a considerable loss. Sindall and Bacon found that as much as 3.55 lbs. of bleach might be used up by 1000 lbs. of back water while tests by the writer on similar samples showed a bleach consumption of 0.9 lb. to 1.5 lbs. for each 1000 lbs. of water. If it is considered that the consistency of the stock in the breaking engine is 4 percent and that the water used is all back water, it would mean that a fiber normally bleaching with 10 percent would require from 12 to 18 percent because of the quality of the back water. Moreover, the repeated use of such water over and over again would very greatly increase this loss because of the accumulation of organic matter. The practice of using back water is not to be recommended unless it is very strong in bleach and unless the pulp can be thoroughly washed before completing the bleaching; otherwise its use is likely to cost more than it saves.

Intermediate Washing

The question of washing the pulp after part of the bleach has been added and used up is one which is worthy of very careful consideration in any plant. Tests on both soda and sulphite pulps have proved that such a treatment effects a decided saving in bleach. If about one-third of the total bleach is added and the stock then washed before adding the other two-thirds, it is found that 9 lbs. of bleach will give fully as good a color as 10 lbs. which is added all at once. This saving of 10 percent of the bleach applies equally well to easy and hard bleaching fibers, but it is obvious that the more bleach the fiber requires the greater will be the saving for a given outlay for equipment and power. A study of these factors should prove without any reasonable doubt whether this modified process would be worth adopting in any given plant. This system has been operated on a large scale over a period of several years and the results obtained found to agree very closely with those of laboratory experiments.

Agitation Necessary

In any bleaching process agitation is necessary. This serves two purposes—to bring each particle of fiber into equal contact with the bleaching solution and thus promote uniformity, and to bring the bleach solution into contact with air and thus hasten the bleaching action. It has been shown by Taylor that passage of air through bleach solutions liberates hypochlorous acid and chlorine, both of which are more vigorous in their action than hypochlorite. This action is aided by the small amount of carbon dioxide in the air and may be still further hastened by agitating with, or leading into the bleaching equipment, gas comparatively rich in carbon dioxide. If the agitation is conducted in beaters in such a way as to shorten the fibers, as in the case of rag stock, the action is still further hastened by the penetration of the bleach into the canals of the fibers which permits it to act on both sides of the cell wall at once.

Use of Acids

A consideration of the use of carbon dioxide, which is a weak acid, naturally brings up the question of the use of other acids and of the alkalinity of the bleach solution itself. It has been stated that the rate of bleaching is decreased if the alkalinity of the bleach is high and that conversely the addition of acid tends to hasten the process. This is due, as in the case of carbon dioxide, to the setting free of chlorine and hypochlorous acid. The acids which have been proposed for this work are quite numerous, from sulphuric down to some of the stronger acids, such as acetic acid. Only a small amount is necessary as it is constantly regenerated during the bleaching process, and it should be added in a highly dilute condition in order to prevent local overbleaching and the formation of chlorinated products of a yellow nature. Acid may be used with comparative safety with rag stock and soda fiber since these have already been given an alkaline treatment, and lignin or similar materials which give a yellow color on chlorination are practically eliminated. Besides the advantage of hastening the bleaching action, acid is beneficial in improving the color of the fiber when it is properly used, which, for this purpose, is at the end of the bleaching process when the bleach is nearly exhausted. Under such conditions it gives to the fiber a distinctly better color than could be obtained by the use of the same amount of bleach without acid.

It is usually stated that acid must not be used when bleaching sulphite because of the yellow color produced by clorination of the impurities accompanying the fiber. This is true if the bleaching is all done in one operation, but if part of the bleach is added with a little acid and the fiber is washed when this is exhausted, it will be found that the addition of a little more bleach will produce a much whiter fiber than if it were bleached with the same amount of bleach added in one lot without acid. This method introduces two modifications from the ordinary process, the use of acid and the intermediate washing and

as already explained the latter causes a saving of about 10 percent of the bleach regularly used. Further tests have shown that sulphite bleached as described with acid gives a whiter fiber than when bleached without acid but with the intermediate washing. The acid, when used in this way, is therefore beneficial though the gain is probably not enough to justify the added expense for acid, for the very complete washing necessary and for the greater deterioration of apparatus due to the acid. The only marked advantage of the method appears to be its rapidity which is such that three-quarters of the amount of bleach required for an easy bleaching sulphite is used up in an hour when the temperature is 95° F.

Bleaching Powder vs. Electrolytic Bleach

The question of the relative efficiency of bleach liquors made by dissolving bleaching powder, by absorbing chlorine in milk of lime, or by the electrolysis of brine is one which has been fruitful of much discussion and there are still those who are firmly convinced on both sides. The bulk of the evidence, however, points to the fact that if the comparison is based on the chlorine consumed per unit of bleaching effect a pound of available chlorine will be found to do the same work whether it comes from bleaching powder, from the electrolysis of brine or from calcium hypochlorite prepared by absorbing chlorine in milk of lime. Ahlin states that it is not true that active chlorine produced electrolytically will do more work than an equal quantity from bleaching powder, and this same conclusion is reached by Higgins who finds that a solution made from bleaching powder is just as good as an electrolysed salt solution. The writer has made repeated comparisons of solutions of bleaching powder with those made by absorbing chlorine in milk of lime and found no difference in efficiency when the comparison was based on the color produced per unit of available chlorine. It is quite possible that some of the arguments in favor of electrolytic chlorine are based on incorrect comparisons in which the effect of some factor has been overlooked, while it is suspected that others may have been put forth originally by those endeavoring to sell electrolytic equipment.

Going Back in Color

No matter what system of bleaching is employed, the completion of the reaction must be watched carefully or the color of the fiber is likely to "go back." This is most likely to take place when the bleach is completely exhausted and the stock remains standing for some time in contact with the spent bleach liquors. It is more likely to take place the higher the temperature, so that if the stock in process of bleaching has to be left for any length of time care should be taken to see that the temperature is as low as possible and that a little bleach remains with the fiber. This going back in color takes place with both sulphite and soda fiber so far as records show has never been observed with rag stock. Its exact cause is not known but it is probably due to the absorption by the fiber of some of the coloring matter from the solution with which it is surrounded. When working on a laboratory scale it is found possible to correct the color of fiber which has "gone back" by the addition of very small quantities of bleach; on a practical scale this is found to be difficult to accomplish, and by some it is said to be impossible.

Discovery in Paper Mill Ventilation

Utilizing Waste Vapor from Machine Room

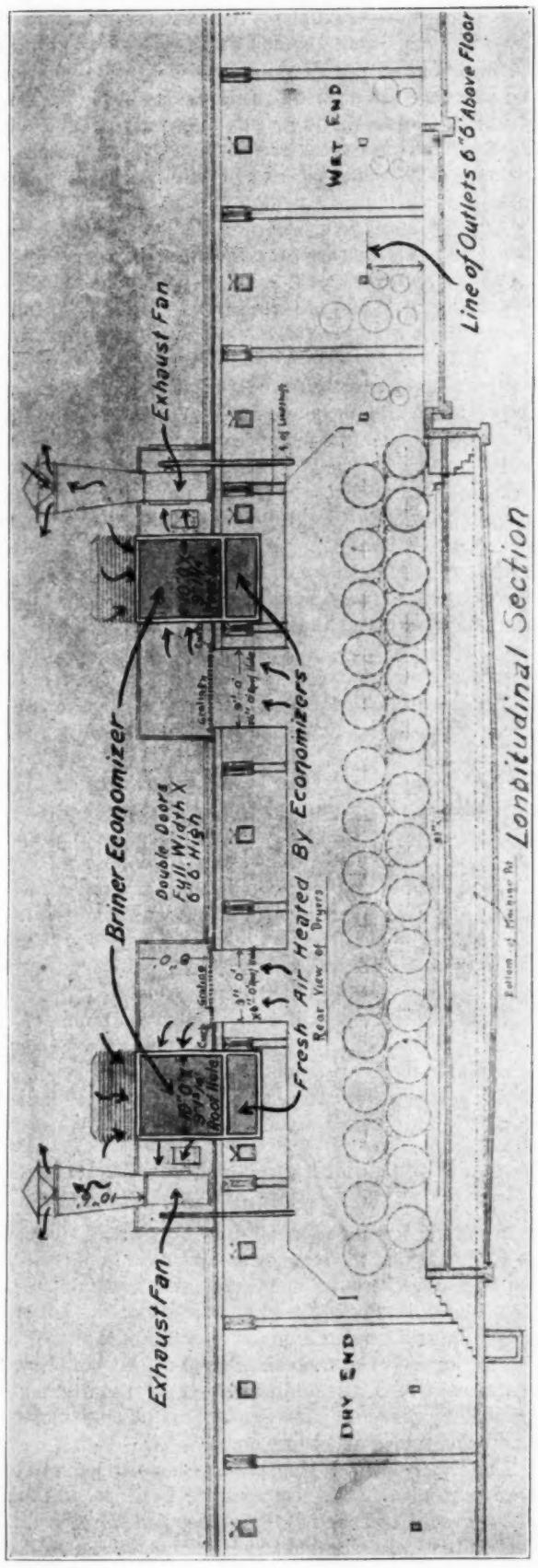
By E. A. BRINER, M. E.

Member American Society of Mechanical Engineers

FOR over twenty-five years paper mill men have watched the hot vapor leaving the hoods and roof ventilators of machine rooms and wished that something could be devised to utilize the enormous waste of heat that occurs in the drying process in the making of paper and dry pulp. It occurs in every mill where paper is made, be it news, wrapping, book or boxboard. It has always seemed like a dream to make practical use of the vapor that floats away in fading fleece—too etherial to be weighed in a balance, too voluminous to be gathered together, too elusive to be piled up anywhere; yet the very essence of an enormous and hideous waste, worthy of the attention of the government at a time like the coal and transportation shortage recently experienced.

Conservation of Coal

In America we have lived bountifully upon our national resources—the inheritance of a bountiful Providence. Unless our legacy of coal is administered with more intelligence and less waste, it may mean serious hardship to all in future. To use one's resources freely, grandly and lavishly, has its justification; but waste of any kind is always odious. It implies prodigality, ignorance of one's own welfare, and indifference to the welfare of others. When the author was a boy he earned some of his spending money by sifting and picking coal out of the ashes in



his father's home. He was well paid for his time, almost as much as the coal was worth—the fires were banked at night with the coal thus reclaimed; but he never forgot the simple lesson.

The conditions of the coal supply during the world war is still vivid in the writer's memory. During all that time he was conscious of the hideous waste of coal in the paper industry. Assuming a daily production of paper and dried pulp of 30,000 tons per day, it requires not less than 7,500 tons of coal daily or at $5 per ton, $37,500 daily payment to the coal trust to continue the waste and extravagance in the paper industry due to the drying of paper and pulp. The author is not referring to how much coal it requires to dry paper, be that what it may; the figures refer only to what is thoughtlessly or ignorantly wasted. Farther on, he will give figures and the basis for same.

There is just one answer to the present "fixed" price of coal—an answer that the coal baron may well dread—intelligent economy. Use without stint is justifiable; waste is odious. Collis P. Huntington, one of America's railroad presidents, would stop on his right of way to pick up a stray bolt. I have seen the president of one of the largest paper mills in Canada pick up and put in a place of safety a piece of pipe worth only a few cents which a workman had carelessly thrown away. Someone seeing this said: "He oughtn't to bother with that." The author replied: "He cares nothing for the pipe or the few cents, it is just that waste is odious to him."

The Story of Discovery

A number of years ago, the author installed a "Vapor Absorption System," blowing hot air directly on the sheet for a large boxboard manufacturer in the Middle West, making over 100 tons per twenty-four hours on one machine. The mill set a fine example in manufacturing and especially in fuel economy. At that time it probably held the record for coal economy per ton of product in the United States. I often thought of the owner as a "Prince of Economy." He could make a ton of strawboard from raw materials, including the cooking of the straw, with 1300 lbs. of Illinois coal. He was utterly incredulous when I told him that as much as 500 boiler horsepower was going to waste out of the roof of his paper mill. He had to be convinced. When he finally acknowledged it, he remarked gleefully: "Yes, I see the horse in there all right; but can you harness him up?"

That sort of loss is taking place and has taken place continuously at the ventilating hoods of nearly a thousand paper machines in the United States and Canada. In spite of all the talk about cost keeping and scientific accounting, there is probably not a single set of books that shows this as a continuous operating loss "up the flue." A hundred ton mill requires that somewhere between 150 and 200 tons of

water in the form of hot vapor must escape every twenty-four hours on the "wings of the air."

Coming into possession of the facts, what was to be done with them? The thought came of looking at machine room ventilation as a breathing process. Cold, dry air must be taken in and warm, moist air must be expelled. The question came: "What would happen to a man in Canadian weather twenty degrees below zero if he breathed through his nose and exhaled through the middle of his back?" Some one has said that his nose would freeze up. Poor construction! Well, that is the way a machine room breathes. This taught me the importance of taking air in and exhausting from the same opening, or making the hot moist outgoing heat serve to warm the incoming fresh air. Air is as important as heat in the machine room.

"White Coal"—Succeeding with What You Have

A hundred ton machine room usually requires an average of 150 boiler horsepower in winter for heating and ventilation, and a maximum of about 220 boiler horsepower. This maximum occurs at a time of the severest cold weather, when the load on the boiler house is a maximum due to the general heating load. The new process reduces the peak load on the boiler house. Is it wise to tap our coal resources. transportation facilities, etc., when one has 500 boiler horsepower in heat units on the roof going to waste? Canadians are justly proud of their natural water power—calling it their "white coal." Here is another kind of "white coal" in a still truer sense of the word. The supply is all that one needs to secure dry atmospheric conditions in the machine room, shipping room, etc., and a lot more to spare for other purposes right at hand. Its use involves no transmission losses. It can be converted into profitable use right on the spot. It is an economic principle, not very well understood, that no matter what the seeming difficulty, the solution is always close at hand and not afar off. It is our business to "succeed with what we have."

Practical Results in Pulp Mill

Mr. W. H. Howell, Jr., who is general superintendent at the plant of the New York and Pennsylvania Company at Willsboro, N. Y., was the first one to recognize the merits of the new discovery and its practical application to paper mills. His quick grasp of the possibility of making an installation without interfering with the operation of his mill was a big encouragement to the author. He recommended an installation of waste heat economizers at their Champlain Mills, averaging about fifty tons daily production of dried soda pulp. This system was installed before cold weather in 1920 and the following description is an extract from Mr. Howell's description given more completely in April number of the PAPER INDUSTRY:

"We are now ventilating our machine room with two (2) fans. One exhaust fan is used for pulling moist air out of the machine hood to the economizer and a supply fan distributes the warm air to various points in the room. The hot outgoing air and the fresh cold air crisscross each other in the economizer without actual contact except through corrugated plates.

"The object of the corrugated plates is to enable the closest possible contact for transmission of heat from hot moist air to the cold fresh air, at the same time separating the moist air from the dry air. Both fans are belted to a single 20 H.P. constant-speed electric motor. In average winter weather (34 degrees above zero) an actual test showed that the economizer is able to raise the outdoor air to 107 degrees for distribution in the machine room in quantity sufficient for all ventilating purposes, and equivalent in heat units to 77 boiler horsepower continuously for twenty-four hours without the use of any boiler steam whatsoever, either live steam or exhaust steam. This result is accomplished solely by using the waste vapor going out of the machine hood and still leaving a large quantity of vapor available for other purposes."

Mr. Howell states: "The results obtained from a ventilating standpoint are the nearest to perfection ever obtained in this machine room, and the economy is apparent as no live steam is used to obtain the results."

Five more ventilation economizers are contemplated for the Wayagamack Pulp and Paper Company at Three Rivers, Quebec, of which two are installed and in use. Their use this winter will expose them to maximum cold weather conditions and under such conditions of cold outdoor air, they will have the advantage of showing the greatest economy. The colder the outside air the greater will be the absorption of heat by crisscrossing it with moist hot air.

In addition to ventilation of machine room and shipping room, it is thought that enough waste heat is available to also provide heating and ventilation of beater room or heat water for beater room or boiler feed to a temperature of about 90 degrees F.

Waste Vapor of Drying Process vs. Exhaust Steam

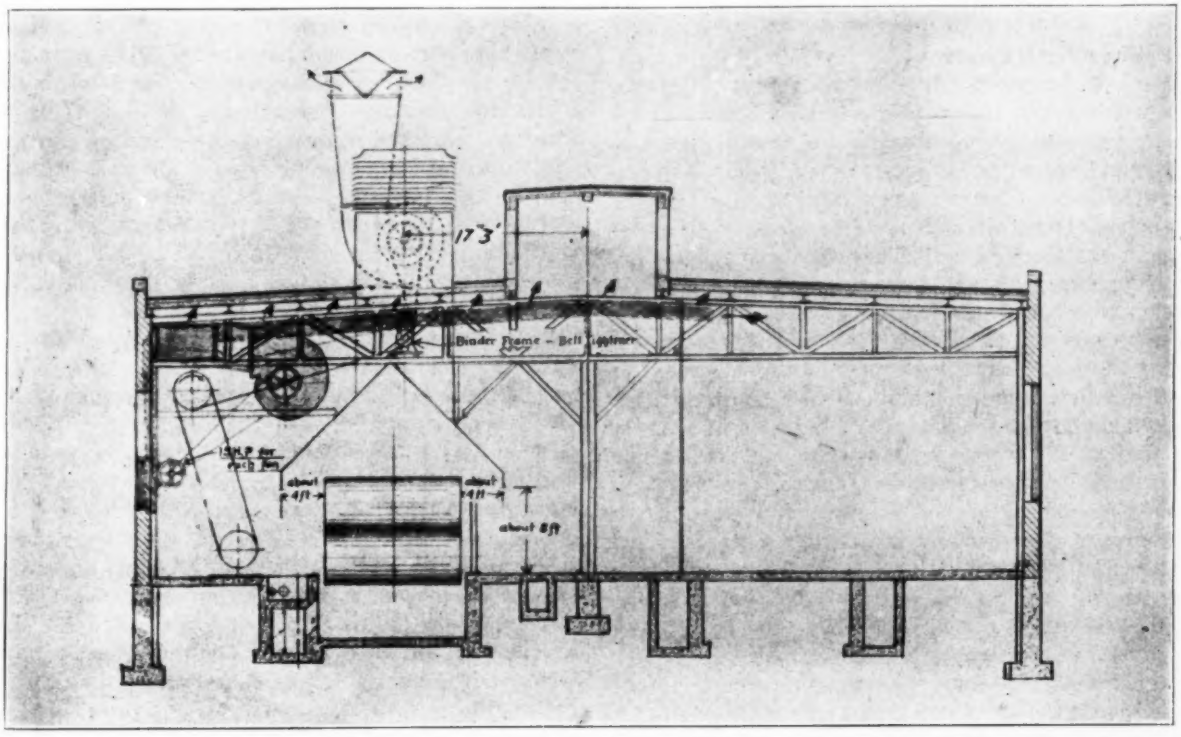
In partial justification of present practice, it may be said that engine exhaust steam is commonly used for heating wherever such exhaust is available. In most plants it is considered good practice to limit the engine capacity to the exhaust steam requirements of the drying cylinders, the heating of feed water and beater water. Any additional steam requirements are usually made up with live steam and this is often where heating load comes on.

The vapor from drying process usually leaves the roof ventilators at a temperature between 100 and 120 degrees F. or about 110 degrees is a fair average. It is quite common to find the air completely saturated

with moisture at this point. Such a temperature mav also be used to heat water in addition to heating air for ventilation purposes. What I wish to point out is that the waste heat temperature of 110 degrees is ideal for ventilation purposes and such use should be the prime consideration. Engine exhaust is of a much higher temperature and can be used to advantage for less seasonal and more constant demands. After waste vapor is used for heating and ventilation a further use may be made of spraying water into it and heating beater water or some such other purpose, economizing all heat possible. A hundred ton production in a paper mill using waste economizers would result in winter in the condensation in the econo-

Production of paper in tons per 24 hours	Water evaporated from wet paper per 24 hours	Water leaving roof ventilators per hour	Waste heat expressed in B. H. P. in water vapor
10 tons	15 to 20 tons	1,250 to 1,666 lbs.	37 to 49
20 tons	30 to 40 tons	2,500 to 3,333 lbs.	77 to 102
30 tons	45 to 60 tons	3,750 to 5,000 lbs.	115 to 154
40 tons	60 to 80 tons	5,000 to 6,666 lbs.	154 to 205
50 tons	75 to 100 tons	6,250 to 8,333 lbs.	192 to 256
60 tons	90 to 120 tons	7,500 to 10,000 lbs.	231 to 308
70 tons	105 to 140 tons	8,750 to 11,666 lbs	369 to 359
80 tons	120 to 160 tons	10,000 to 13,330 lbs.	308 to 410
90 tons	135 to 180 tons	11,250 to 15,000 lbs.	346 to 461
100 tons	150 to 200 tons	12,500 to 16,601 lbs.	385 to 490

The boiler horsepower given in tables is calculated upon the scientific fact that there are 1030 British Thermal Units Latent Heat in each pound of water



mizers of from 300 to 700 gallons of pure distilled water per hour, depending upon the outside temperature. The condensate would be at about 90 degrees F. good for washing felts or for boiler feed. Soft water is preferred for washing felts.

Quantity of Vapor Leaving the Dryers

The following figures show at a glance the approximate amount of water in form of hot vapor which leaves the dryers in any particular machine room, differing only in a slight amount with the particular kind of paper manufactured. The steam dryers drive the moisture out of the paper; but it requires fresh air in a definite quantity to convey it out of the roof ventilators, as air will not carry off vapors beyond a condition of saturation. The figures are surprising. They are accurate for general purposes and may be positively relied upon for estimating these heat losses.

vapor at average temperature of 110 degrees F. and 33,470 B.T.U. per hour equals one boiler horsepower in accordance with standard of American Society of Mechanical Engineers.

The above figures do not include what is called the sensible heat above 32 degrees F. in water and in the required quantity of dry air holding this vapor in suspension. If such quantities are added, and they are available in winter, they add approximately a total of 33 1-3% to the above figures of boiler horsepower going to waste from roof ventilators of machine rooms.

Utilization of the Waste

There has been quite a marked improvement in the past five years in the ventilation of machine rooms. Nevertheless the high temperatures and moist conditions are far from ideal. Owners are unconscious of the everlasting expense of operation of these systems

or else simply accept the operating expense as something in the nature of the inevitable. Even in winter some machine rooms have an atmosphere like the Philippine Islands in summer, which is conducive neither to the mental nor physical activity of the operatives. The author asked one of our big paper mill superintendents what he thought of some of the present day welfare work. He replied: "The most important thing you can do for the men is to improve the conditions in which they actually work."

While a great deal has been said about economy of fuel, it is accompanied by what is most important—dry atmospheric conditions in the machine room, approaching the ideal for comfort and maximum production.

Construction of Economizers

For long life they are preferably built of Galvanized Keystone Copper-Bearing Metal, Toncan Metal or American Ingot Iron. For special conditions they might be built of copper, duralumin or other suitable material in corrugated form. On one side of the corrugated plates is pure fresh water vapor and on the other side fresh air. There is no pressure on either side of the economizers. They are arranged so that they cannot leak and require less attention than steam heater coils now in use. In many instances the economizers can be arranged so as to utilize present fan system and galvanized air ducts for distribution of fresh air against underside of roof. In some cases, new distributing systems may be dispensed with on account of the more abundant supply of fresh air at moderate temperature. The entire equipment is placed on roof or in roof truss, which by the way is the proper place for any ventilating equipment in a paper mill. Such position leaves entire floor space strictly for production of paper. The hot moist air passes through corrugated plates in a direction parallel to corrugations, while fresh air travels through each alternate passage in a serpentine path being baffled in its course by the corrugations so as to increase its absorption of heat from outgoing moist air.

Summer, Late Spring and Early Fall Conditions

The author has found from inspection of hundreds of machine rooms that in order to economize steam and attention, the roof drying equipment is not run during above seasons of the year to take care of moderate amounts of roof condensation in what may be termed cool summer weather. Such conditions increase depreciation of roof and equipment due to sweating and drip. The economizers are now provided with a bypass so as to get any low temperature desirable in summer or early fall and keep underside of roof dry and room comfortable. Paper mill men know by experience that in cool summer weather, the cool outside air cannot be circulated through air ducts without causing condensation on the outside of duct and often on underside of roof. The temperature of the outside air must be raised to a point not less than ten degrees lower than the overhead room temperature.

Cost of Ventilation and Heating for Machine Rooms, Etc.

It is difficult in handling the general problem to give accurate ideas of cost of operating the present typical fan heating and ventilating systems of machine rooms, such as are designed to prevent fog, sweating, and drip. Nevertheless without giving some idea of saving to be effected, this paper would be incomplete. Engineers have recognized that such fan systems are economical and the best on the market for the purpose. However, the author is aware that a great misunderstanding exists as to the cost of operation of such systems. In some mills, where engine exhaust steam is used that might otherwise be wasted to atmosphere, the cost of heating and ventilation is not very great. The cost of such engine exhaust steam becomes valuable only when it can be used for other purposes besides heating and ventilation. If such engine exhaust cannot be used for any other purpose than heating and ventilation then the owner does the most economical thing in using such exhaust in fan heaters of his ventilating system. Such a case I will not touch upon as it is both economical and satisfactory. The large majority of cases in paper mills mean heating and ventilation with only a part of engine exhaust available for heating. There are also a large number using all live steam for heating. For the purpose of estimating the operating cost in a general way, the author is going to tabulate the case, assuming that the heating and ventilation is done with live steam and that the coal cost in such a mill is $6.00 per ton at the mill. An average winter must also be assumed, for example latitude of Glens Falls, Kalamazoo or Holyoke. This results in the following comparative figures, leaving the reader to deduct any part of the annual cost which may be offset by partial use of engine exhaust:

Daily production of paper or dried pulp	Annual cost of heating and ventilation of machine room alone (based on use of live steam)	Daily production of paper or dried pulp	Annual cost of heating and ventilation for machine room alone
10 tons	$1,600	60 tons	$ 9,600
20 tons	2,200	70 tons	11,200
30 tons	4,800	80 tons	12,800
40 tons	6,400	90 tons	14,400
50 tons	8,000	100 tons	16,000

It must be understood that the above figures are not absolute. They simply give a bird's-eye view of the cost. In most places these new economizers will yield from 40 to 90% on the investment. Coal at $6.00 per ton is by no means a uniform price at the mills in the United States and Canada. For Canada, where water power is generally used, it may be necessary in some localities to divide the above operating cost by six and multiply by ten. One thing is sure

about these figures, namely that whether greater or less, they can be practically wiped out by the use of the new ventilation economizers. The author is taking a little liberty in making such a statement. He has to assume that some power, such as line shaft or electric power, must be used in driving the fans of any system that is in common use; and also that an exhaust fan is required as well as fresh air supply fan. Such cost would not be much greater whether an economizer is used or not. The point is that with the new discovery, the waste heat from the drying process is used to eliminate the coal bill entirely for machine room ventilation and for the ventilation of other adjoining rooms, and there will still be an abundant surplus of heat useful for other purposes. Every mill having a drying process for paper or pulp, can have its share in reaping the savings possible by this discovery. Every mill can share the satisfaction of thoughtfully conserving our coal resources. "Utilization is grand." "Waste is odious."

Six Definite Things That Workers Want

A Steady Job

By JAMES H. COLLINS

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There are a series of six chapters on this subject written by Mr. Collins, and they will appear in successive issues of this magazine. In presenting them to our readers, The Paper Industry believes they will be valuable not only for their timely interest but from the recognized standing of their author.

Mr. James H. Collins is one of the highest paid writers on business in the United States. For twelve years he has contributed business articles to the Saturday Evening Post, and was formerly a contributor to Printer's Ink. He has also contributed to Country Gentleman, McClure's Magazine, Ladies' Home Journal, and to a number of well known business publications. In England his work appears regularly in World's Work Magazine.

Mr. Collins has traveled extensively in England, France, Germany, and other foreign countries, investigating business conditions. During the war he served as Head of the Trade Press Section of the U. S. Food Administration. He worked on the Committee of Public Information and was also Assistant to Chairman Hurley of the U. S. Shipping Board.—Editor.

WE WILL call them A and B, these two factories — they are almost across the road from each other over in New Jersey.

A held its labor turnover down to within reasonable limits, even during the boom, while B had to hire three or four workers a year to keep one on the job. A has never had a strike in its thirty years' existence, while B, in half the time, has had strikes, lockouts and boycotts. Labor organizers have never got a foothold in A, where B is a recruiting ground for the organizer and radical. Finally, today, in the depression, A is running two-thirds time, and keeping its key men together, while B has been brought close to a complete shutdown.

What is the difference between these plants? They both make pretty much the same kinds of goods, have the same territory from which to draw labor, pay about the same wages. What causes the contrast?

If all the facts were gathered they would make a bulky report. But the real reason is that people who work in the factory with the happy history have steady jobs, while those in the other factory haven't.

What is a steady job?

Most people would say, "Regular work at good wages." But there is decidedly more to it than that.

Work seldom holds the worker unless it is interesting, fitted to his temperament, something which he can excel at, and take pride. A pleasant place to work, and efficient tools are part of it. So is management that understands him, and stability that leads him to trust his future with the company. Some workers want a job that is growing, and opportunities for growing with it, while others are satisfied with routine tasks, but want to know that they will be taken care of when their working days are done. Then channels through which workers can reach the management when things go wrong are being provided more and more in present-day industry, and along with greater frankness on the part of management in giving workers information about the business and their policies, these make for stability.

If a steady job is just regular work at good wages, then B factory should have had no trouble during the boom. Actually, men drifted in and drifted out of that plant as though it were a railroad terminal. Even war wages would not hold them to tasks they did not like, nor under leaders they did not like. And A factory took the labor drift from its neighbor, sorted it over, fitted men to suitable tasks under the right leaders, and boosted its output both in quantity and quality.

The Creator has made people different temperamentally. Much labor turnover can be traced to management that deals with people as though they were all cast in the same mold. There are phlegmatic, plodding people, men as well as women, salary as well as wage earners, who not only prefer routine jobs, but often work best under a boss of the opposite

temperament, who will do the thinking and take the responsibility. And there are people of an energetic, adventurous type who love variety and excitement in their work, and very often do best under a boss who, while not exactly phlegmatic, is still a steady wheel horse who keeps them from flying off at tangents.

A good deal of labor turnover occurs among these adventurous folks. Improperly placed, dissatisfied with the kind of work assigned them, they go from plant to plant looking for the ideal job—or maybe just a new one. Adventurous folks are the most imaginative and energetic, just the ones to become leaders, turn work into play, make suggestions and improvements. It was largely by proper harnessing of this energy through a skillful employment director who took pains to fit jobs to temperament, that A factory made a splendid war record.

Yesterday, a steady job was largely a piece of luck, to the worker who found it, and the employer who was able to grant it.

Today, we see that it is something that employer and worker can create through intelligent teamwork, something with roots in the employer's policy and the worker's willingness.

What teamwork will accomplish in creating steadier employment is shown in the present activities of our two factories. The A plant is now working part time, on reduced wages, but its employes are meeting living expenses, while plant B is almost idle and thoroughly disorganized. The first factory has been able to keep up the quality of its goods, while the other hasn't. Steady jobs make steady men—they must have skill to hold them. Steadiness and skill mean quality in the output, and in hard times quality enables the sales force to land the order, and also get volume upon which to make prices attractive.

Stabilizing Shop Work

Down in Texas there is a railroad which has one commodity as its principal basis of freight traffic, and about three months' work hauling it out—the cotton crop. This created very difficult conditions in its repair shop, for mechanics had irregular employment, and were chiefly floaters. An efficiency engineer was given the task of stabilizing shop work. After a study of the whole year's task, he announced that mechanics would be guaranteed so many hours' work in the year, enough to meet living expenses with a margin, but that men would be asked to work as many hours a day as was necessary. During the period before cotton hauling, when every locomotive and car had to be put in good order, this might be ten or twelve hours a day. When rolling stock went into service, the shop force would be diverted to the making of parts for next year's repairs, dropping to eight or six hours daily. Under that plan a smaller force of more skillful mechanics was soon doing the company's repair work at materially lower cost.

Set up the steady job as something to be realized, and every department in a business is immediately concerned. Not only the great corporation with its facilities for organization, cost accounting and control, but the small enterprise managed by an individual, or partners, where the personal relation between employer and employes exists.

It becomes necessary, as a first step, to measure production, capacity of equipment, and sales possibilities—perhaps for the first time. When these are known the number of workers who can be employed all year round is known. With reasonable assurance of enough work throughout the year to give them a livelihood, the better class of workers feel secure, while there is a decrease in the number of floaters who make up costly labor turnover, and in the unskilled and careless people who lower the quality of the product. The sales department gets a new picture of the year's work, and knows where to center effort both in seasons of decreased demand and territory capable of greater development. The financial, purchasing, accounting and other departments can plan their year's work, avoiding pressure and delay in busy months, and reducing expenses and inventories during slack seasons. Repairs, replacements and extensions are arranged so that they do not interfere with production, but make slack-season work, and there is a general leveling off of peaks and filling up of valleys, straightening out the entire curve of the business.

Appalled by the unprecedented unemployment problem in Great Britain, English economists have lately been asking themselves if it can be remedied. And the best opinion maintains that it can, if employers and employes will get together and work for volume and quality with salesmanship to increase and stabilize outlets both at home and abroad.

Tomorrow, the steady job promises to be our national standard, something to be achieved and maintained by taking the slack out of industry. Viewed nationally, it is bigger than any employer, or any body of employes, or any industry, or labor organization. It means the elimination of mismanagement by executives, of soldiering, floating and idleness by employes, of the reduction of fluctuations caused by seasons, booms, slumps, speculation, waste, lack of organization and system. It is just about as big as the United States, and concerns not merely everybody connected with industry, but everybody consuming industry's products, and furnishing it raw materials.

To live as greatly as I can;
To be, no matter where, a man;
To take what comes of good or ill,
And cling to faith and honor still;
To do my best, and let that stand
The record of my brain and hand;
And then, should failure come to me,
Still work and hope for victory!

—Edgar A. Guest.

Electric Trucks Make Saving

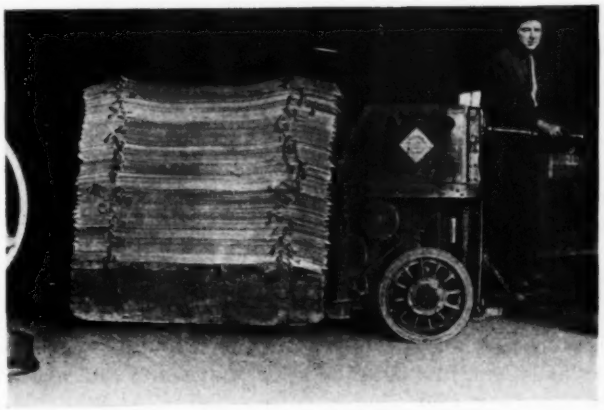
Illustrations Showing Adaptability of Electric Trucks and Some Statements Made by Paper Mill Executives

One of the two electric trucks which, according to official report, has been giving daily and perfect service in the plant of the Continental Paper Co., Bogota, New Jersey

A load of 4,300 lbs. of box board paper on one of the electric trucks in operation in the R. B. McEwan & Son Mill, Whippany, New Jersey

"Electric trucks saved them about six men in addition to moving stock much quicker."

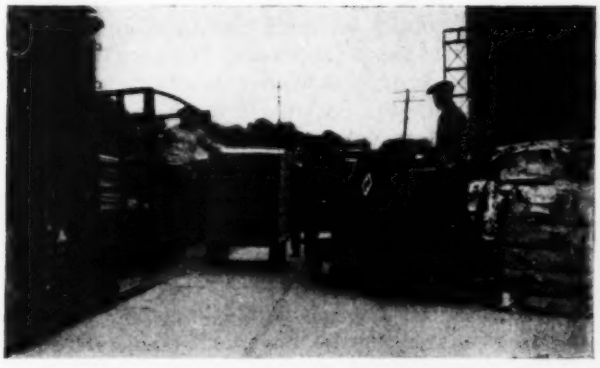
"Before purchasing an electric truck, it required six men to load 50 tons in one day, now five men handle 80 tons per day."



Successful adaptability of electric truck in the Robert Gair Company, Piermont, New York, handling paper board

"Electric truck loaded 81 tons in 8 hours, each load averaging approximately one ton, and the hauling distance from finishing room to cars is approximately 300 feet."

Another one of several electric trucks in the Robert Gair Company plant at Uncasville, Connecticut



One of the two electric trucks giving daily and perfect service in the plant of the Federal Paper Board Company, Inc., Bogota, N. J.

Using a Camera to Promote Safety

By A. ELLIS FRAMPTON
Editor "Hammermill Bond," Hammermill Paper Company, Erie, Pa.

Address before the Paper and Pulp Section, Tenth Annual Safety Congress of the National Safety Council, Boston, Mass., Sept. 26-30, 1921

CIVILIZATION depends upon the communication of ideas from men to men. Were this not so, the horse, the dog, the elephant—all animals of high intelligence—would contest with man his mastery of nature. The truth is that these animals are so unfortunate as not to possess organs of speech or an organ such as the human hand, by which they might through some picture language or hieroglyphics pass on to their fellows and succeeding generations the experiences and thoughts which they have had.

From the earliest dawn of primeval history the human race has been trying to solidify and preserve its experiences. This effort has given us drawing and painting, spoken language, the written word, all of our laws, art and literature. These things are our permanent possessions, heritages of those who have lived and died, whose minor deeds and thoughts have been forgotten, but whose universal experiences have given us the ground work of the world which we know and live in.

In the caves of the earliest progenitor of mankind we find crude efforts to portray the world of their far gone day; we find efforts to depict the experiences of those hairy men who first discovered that a grooved stone with a forked twig tied about it gave them a tremendous advantage over other unarmed men, and over the monsters with which they competed for existence. We find in these age-old efforts to pass on knowledge, the same underlying psychology which we are endeavoring to use today in the propagation of the safety movement. We who are endeavoring to minimize the risks attendant upon an industrial civilization, to build in the minds of all—from the infant to the most developed intellectual, a consideration of human life and a carefulness in human activity which cannot but benefit this and succeeding generations are fundamentally reaching out to accomplish but one thing, and that is to transmit ideas. We seek to learn the experiences and thoughts of others who may have something to contribute to the safety movement, and we try to pass on those experiences and thoughts to those around us. This is our problem.

There are but three major ways of communicating thought—by speech, by the written or printed word, by picture language. The safety movement uses all of these, and uses them both extensively and intensively. We find enthusiasm engendered by capable speakers addressing the men in our plants and shops. We use our newspapers, our general magazines and our plant papers in an effort to concentrate the thought of the average man upon the problem of personal safety. Through bulletin boards and plant magazines we employ the picture language to further impress the mind with a good idea of personal carefulness.

Making Use of the Picture

It is with this last means of communication—the use of the picture—that I want to deal for a few minutes. I believe that it is a powerful agent for the transmission of safety thoughts. I believe that on an average it can be used to a larger extent than we see it used. The delicate shadings of language, the impressiveness of poised shaft of rhetoric, the balanced thought of the carefully punctuated sentence, are somewhat foreign to the picture, it is true, but on the other hand there is a virility and force to a well executed drawing or a well posed photograph that has a universal appeal. The marvelous growth of the moving picture industry is a tribute to this strength of impression, this case of understanding. Even the literary man tired of words to the point where they lose their best meaning, may go to the movies and be entertained.

There is another side to the use of pictures which is worthy of thought. It is this—that those who work in our great industrial establishments are in many cases unlettered. They read with difficulty, maybe not at all, but they can understand the moral of a photograph which shows perhaps their fellow workman, John Jones, posing in some dangerous practice which all should avoid.

You are acquainted with the phenomenon of a blind man identifying a dollar bill by running his finger over it. The answer is, of course, that the loss of one of his senses has intensified the ability of another sense to receive impressions. Now this same thing takes place with your illiterate workman or your man who has difficulty in reading. Being somewhat shut off from the accumulating of ideas in one common manner, he becomes more acute in receiving ideas through other means—if he cannot read the words, he gets all the more meaning from the picture. This means, of course, that pictures used to preach safety must be true, must carry their lesson clearly and must avoid anything which might detract from the force of the lesson you wish to impress.

It is not possible for many of us who are turning out safety bulletins or spreading the word of safety through plant magazines to have the services of a skilled and understanding artist, but any of us can

use a camera, and in using it add mightily to our message of safety.

Do you know of anything as interesting to you as yourself? And next to that, of anything as interesting as the human beings with whom you are closely associated? It is rather certain that you do not. Then why not use these fundamentally interesting people in getting across your safety message? Bill Smith is very much interested in Bill Smith. Very well then, have Bill pose at his work in some manner that will portray a thought for safety. Of course you cannot have Bill in every safety picture, so you will have to do the next best thing and use on occasion those with whom he is directly in contact. Have his side partner, Jim Brown, pose another safety lesson. If you will keep this up over a period of time, using these local interest safety photographs on your bulletin boards or in your plant magazine, I promise you that you will get attention to them from the very ones whom you wish to impress, and that you will perform an incalculable service in the interest of carefulness.

But you say, "I am not a trained photographer, nor a moving picture director. How shall I know what pictures to get?" Again you say, "Won't posing for such pictures seem silly to Bill Smith and Jim Brown?" To this last question the answer is to be found in the sincerity with which you approach these men, and in the seriousness with which you treat their effort to portray a safety lesson.

To the question, "What pictures shall I make," the answer is to be found in your own ingenuity, in the study of safety bulletins and plant publications that are using such local safety photographs, and in the ideas of your workmen themselves.

Camera and the Notebook

Let me suggest that you keep a little note book of safety ideas, particularly applicable to your local conditions. Take a camera and your note book and go around your plant. Look for suitable backgrounds, preferably places which give you fear of accident, or places where accidents have happened. Call over workmen who have to do with these places. Explain to them that you wish to portray to everyone in your establishment the danger of this place, and have your men act to expose this danger. When you put this picture in bulletin form or in your plant paper, be careful to say that the men in the picture understand the danger and that they are acting for the benefit of their fellows. If you have never used such bulletins or pictures, I believe you will be agreeably surprised at the reception they will receive in your plant. They tap, you will remember, the two fundamental interests: self and associates. We have been using art of this kind in our plant for nearly two years with really pleasing results. Some of it has been found worthy of going into national safety council bulletins for general distribution, even though our prime thought is to get pictures suited to our own particular plant.

We feel that the use of the camera has been a valuable adjunct to the work of our safety director, and, indeed, he is enthusiastic over it, and gives much thought to the best use of this medium of safety preachment. We use the camera to portray dangerous places and dangerous practices. We use it to teach the right way of performing a piece of work as opposed to the wrong way. We use it to praise the man who has performed some conspicuous service in our plant for the cause of safety. We use it to impress the mind that our first aid dispensary and first aid kits are for use freely and promptly. We use it to portray new safety work which has been accomplished so that we may impress the workman with the fact that our management is keenly alive to his value as a human being, not merely as a producing unit. All these ideas, and more beside, may be developed in your own plants.

Now just what sort of equipment should you have for getting these pictures? Any camera will do, even the simplest. If you must take inside photographs. get yourself a hand flashlight outfit, or learn the time exposure capabilities of the machine which you use. There is just one rule in taking pictures, that is, to keep within the capacity of your lens. If you have a cheap camera, don't try to set up a background that only a Graflex could catch; but get sunlight to help you. It isn't the camera nearly so much as the judgment you use, the locations you select, and the care you take in arranging your subjects, that is responsible for success.

Subject for Pictures

Now just to suggest a few of the subjects which we have used, in order that you may see how the camera idea may serve you. Here is a photograph of one of our men whose loose coat sleeve caught in a revolving shaft. His coat was torn from his back and only his presence of mind in bracing himself against the iron work of his machine saved him from serious injury. This photograph, incidentally, was later used in a Pulp & Paper Section bulletin.

Again we have a little drama in which three of our Italian born laborers take part. Pietro is wielding a pick. Sam, a new man, carelessly comes up behind him. Pasquale seizes Sam and draws him out of the way of the flying pick. These men take great pleasure in posing for this picture. They receive a strong lesson themselves and impress the point of their playlet upon the minds of their fellow countrymen, many of whom are doing the same work as they.

Next we have just one of many pictures showing a man whose eyes have been saved by wearing goggles at his work. Then we find a batch of unsafe ladders by turning the safety committee loose in the mill in quest of them. We round up these killers, pull loose a few of the more dangerous rungs with our bare hands, and take their pictures. We take advantage of the opportunity also to have some of the men pose in

positions which may befall them if they use the bad ladders. Some of these pictures were borrowed from us for the National Safety Council bulletins.

We find some of the men in the mill lifting objects the wrong way. We take a pair of photographs showing the right and wrong ways of lifting. Needless to say the man who posed the two pictures will lift the right way ever after.

Around a paper mill there are to be found tubes, rolls, cores, pipes, shafting and hosts of other round objects which may roll when stepped upon. We have one of the men posed taking a spill on a lot of shafting. You are acquainted with the story of the motorist who ran over a man and then as an afterthought hollered back, "Look out!" The victim in dismay replied, "Are you coming back again?" We find this attitude in line with workmen who frequently, without regard for those below, throw objects off of roofs or scaffolds, crying out, after the piece just left their hand, "Look out below!" We take a photograph of a man being hit under such circumstances.

Again, in passing through the mill we find a safety guard removed from a circular saw, which is left exposed through the carelessness of some man who has not learned the safety lesson. We take a picture of the saw just as it was left, and use this photograph with a little preachment in our plant paper.

The carrying of pipes, planks and other long objects, quite frequently is the cause of injury to some unwary individual rounding a corner. If the front end of these objects is elevated the unwary many may pass underneath without injury. So we pose an electrician carrying a piece of conduit tubing the right and the wrong way.

Here is a trucker with several cases of paper nicely balanced on two wheels. Since the load is heavy and the balancing so delicate, there is the temptation for other workmen to have a little horse play by giving the truck a hit, so we impress the fact that any movement beyond its center of gravity may upset the truck and injure the practical joker, or the men pushing the truck.

Going through a broken train is a lot shorter than walking around it, or going up to the crossing, many times. So once in a while, just to keep our men in mind of the danger, we go alongside of a freight train and take unposed pictures of men passing through a broken train that is being switched.

We find a man sitting on the sill of a second story window. We take his picture and use it in a bulletin. Then, to make sure the practice will not be repeated at that place, the safety director closes up the window with a grating.

We have a nice first aid room. It is for use, and the more it is used the better we are pleased. So we have one of the men pose having damaged hand bandaged by the first aid nurse. This, frankly, is a bid for trade, and we find that such pictures increase the patronage of our first aid dispensary, and reduce lost time from accidents.

Here is our old friend—the protruding nail left in the pathway by a careless workman. The lesson is obvious.

You are all acquainted with our friend the pulp pile, and how, as it dries, it settles on the outer edge, arching over at the top. Our workmen are acquainted with it, too, but we find no harm in reminding them of the danger and in telling them to keep away from pulp piles that look the least bit dangerous. Hand axes, picks, pickaroons, take their toll of injury in ways that these objects may cause inquiry if handled carelessly, or left around carelessly.

Here is an elevating truck being used as a racing car. The danger of this practice lends itself very readily to photography.

The foregoing are merely a few of the ideas which have been used and which may be used. They are indicative of the broad scope that a hand camera has in a pulp and paper mill. We have never yet run out of appropriate subjects for our camera and we do not expect to in the near future.

How to Use the Photograph

After you have your pictures taken, you of course must have them made into cuts, unless you intend to use them only on safety bulletins. In either case, the use of glossy paper for the prints is preferable to the flat-finished paper. There is greater detail in a glossy paper, it is more readily photographed by the engraver; and if used in a safety bulletin, rejects dust better than the duller surfaced paper. In having cuts made from the photographs you may find it occasionally advisable to have the engraver silhouette the acting figures, leaving a background of white paper. On the other hand, a well chosen background of a part of your own plant may give the local impress that will strengthen the lesson of your picture.

In using your photographs in an employe's magazine, it is advisable not to crowd two or three safety pictures on one page. Give them breathing space so that one picture may not neutralize or deaden the effect of another. A three or four-word head above the cut will add to the strength of your picture, providing the three or four words are chosen for their directness and appropriateness. Little slogans that will stick in the mind often make the lesson of the picture more durable. We confine our safety photographs to specific safety pages in our plant paper, but this is a matter of personal choice. You may wish on occasion to "first-page" them or to give them other prominence, in accordance with whatever publication policy you have.

In summing up, there seems to be one vital thing that must never be forgotten—first have a message. Get it clear in your own mind, or you cannot transmit it clearly to other minds. If the idea which you wish

to carry is not specific in your own mind, how can you expect it to be forceful in the photograph which you take to portray it? If you have not been using a camera in conjunction with your safety work, you may find that the judicious use of a spool of film a month will add considerably to the effectiveness of the other means which you utilize to impress the message of safety.

Idle Time as a Manufacturing Loss

By H. A. WINGATE
Asst. Sec., C. H. Dexter & Sons, Inc.

Presented at the Sixth Semi-Annual Convention of the Cost Association of the Paper Industry on October 6, 1921, at the Drake Hotel, Chicago.

DURING this period of depression and sub-normal production, this subject is timely and a problem most of us have endeavored to solve. We hear the statement frequently that when production goes down, costs go up. Do costs go up?

If a company operates two plants in different localities, the manufacturing costs in Mill No. 1 would not increase because Mill No. 2 was not operating. Therefore the same reasoning applies regarding the cost of paper on one of two machines when the other is idle.

The principal problem of cost finding is to assign the expense or burden so that each production unit shall bear its own share. An examination of the expense items will show that while some remain fairly constant others vary with the volume of the business.

Such items as rent, taxes, insurance and depreciation of buildings do not vary materially, whether the plant is active or not. Such expense can never become zero, no matter how slight the production. Depreciation may be greater when the factory is idle than when it is in operation. Other items of expense are affected by changes in the volume of business. Indirect labor and operating supplies are directly affected by such changes, moving up and down as the production varies, though not in direct proportion to such variations.

It is also important to notice that profits do not vary in proportion with the volume of the business. Fifty per cent production does not mean half profits, as there is always an irreducible minimum of expense items, and if this minimum is high compared with the variable charges due to the activities of the business, a slight decrease in business may cause an operating loss.

In every business there is a break even volume; that is, every company must manufacture a certain number of units in order to carry on the fixed overhead and that amount of direct expense which becomes necessary to the manufacture of that particular quantity produced.

As soon as the company passes this point, however, the increase in percentage of profits is very marked inasmuch as the fixed overhead does not increase and each additional unit produced decreases the unit expense cost. Neither does the direct expense increase in any such proportion as amount of production. We must bear in mind that there is a great danger, even in increasing production, for the minute that you have to increase your fixed expenses, then there is a real problem to face. Increased production may only lower costs so long as it can be handled with the present plant and equipment.

Expense may vary according to time, as a large amount of coal may be purchased but the consumption of this coal may extend over a period of months. Extensive repairs may be made to buildings or machinery. These expenses will fluctuate with little reference to the amount of business handled, therefore it would not be fair to current production to charge off this heavy expense against it, as this method would favor either future or past production.

In establishing normal rates we must analyze expenses carefully over a sufficiently long period.

Among the important burden items are such Fixed Charges as Taxes (other than Federal Income and Excess Profits), Insurance, Depreciation and Repairs. Taxes and Insurance should be distributed on the basis of the net value of the equipment in each department. This only refers to Fire Insurance and Taxes on the plant.

Depreciation is one of the most important of all the overhead expenses. There are several methods of figuring the amount of depreciation. A simple method for determining depreciation is to estimate the scrap value of the equipment and deduct this amount from the original cost. This difference is then divided by the estimated years of usefulness of the machine.

Repairs are also an expense item for the maintenance of the plant. The repair shop should be treated as an individual unit and each job repaired should be charged to the department for which the work has been done.

The power plant is an important factor and its operating costs form a considerable part of the burden. Each department using steam or power should be charged with its share of this cost. Records should be kept showing efficiency of the boilers.

Variable charges or controllable expenses such as

miscellaneous supplies and nonproductive labor are also items of factory overhead. These items should be charged to an account called General Factory Expense.

When all these charges making up the overhead or burden have been analyzed and carefully distributed to the several departments a total burden charge for each department can be ascertained. This total divided by the normal operating time established correctly will give a fair burden rate per hour.

Errors are often made in establishing normal rates over a period of a year. This method under normal conditions would be correct, but in times like the present, when the situation six months ago was entirely different from that of today and with no expectations of that same condition being reached again for a long time, I believe it would be a serious mistake to include figures pertaining to the past period in arriving at present day standards as a measure for future operations.

The setting up of normal charges does not mean that we can abandon the analysis of actual burden costs. The analysis of actual expenses and estimated, reveals an interesting comparison.

Normal hours do not mean possible working hours, as many hours are lost during the year on account of Holidays, Repairs, Low Water and similar reasons. In estimating normal hours it is necessary to make an allowance for lost time due to the above causes.

Normal Production

It is generally conceded that eighty to eighty-five percent capacity is a normal production. I would recommend figuring for standards to be used on this basis.

In order to illustrate this point, let us assume that a manufacturer after careful study and taking into consideration present conditions and trend of the times, has established normal rates in the several departments through which his product progresses and he arrives at a Beater Labor and Burden rate of $1.60 per hour, Machine rate of $5.50 per hour, etc. The books of the company will be operated on costs as shown by these rates during the period decided upon.

As each month passes, the costs of actual operation are found and measured against the normal rates and the difference noted. This difference represents the cost of Idle Hours and is chargeable to Profit and Loss or an Unearned Burden Account.

For example, let us assume that the actual operating costs per hour over a certain period in relation to the standard or normal cost were as follows: I am presenting a theoretical cost, first arriving at a normal final cost, then showing how the idle hours affect this cost by departments. The normal beater labor and burden cost is $1.60 per hour and the actual cost is $2.40 per hour. The normal machine cost is $5.50 per hour, while the actual cost is $8.00 per hour, etc. The normal final result shows a cost of $0.206 per pound, the actual or increase caused by idle hours gives us a cost of $0.248, or $0.042 additional.

There has been in the past and there are still many different opinions as to the correct method of calculating and handling the increased cost occasioned by idle machinery and reduced production. Many companies figure their standards and charge the difference between the cost of manufacturing on that basis and the actual cost direct to Profit and Loss or an Unearned Burden Account. I strongly believe that there is a great benefit to be obtained by going a step farther than this and show the unearned portion of the expense against the final cost in the manner described. It should always be figured separately, however, so that it will not be lost sight of.

Whether we believe it or not, the fact of having the actual cost before the manufacturer is bound to force him to a realization of the situation, and I believe the average man with these figures "boiled down" and placed against the individual runs of paper is in a far better position to meet intelligently the problems confronting him and will make him a

COST SHEET

Machine broke ..... 400#
Trimmings ..... 450#
Defects ..... 100#

Total ..... 950#

Date, Sept. 15, 1921.
Machine No. 2.
Beaters, 10. Run No. Lbs. 9,100

Quantity—Grade		*Normal Cost*		*Actual Cost*	*Increase*
Raw and prepared material cost		$1,050.00		$1,125.00	$ 75.00
Beater labor and burden, 180 hours	$1.60	280.00	$2.40	432.00	144.00
Machine labor and burden, 45 hours	5.50	247.50	8.00	360.00	112.50
Finishing labor, 600 reams	.12	72.00	.14	84.00	12.00
Finishing burden	120%	86.40	150%	126.00	39.60
Finishing material		70.00		70.00	.....
		$1,813.90		$2,197.00	$383.10
Credit 950# broken		28.50		28.50	
		$1,785.40		$2,168.50	
Selling expense		90.00		90.00	
		$1,875.40		$2,258.50	

Normal manufacturing cost, lb. $0.196
Total normal cost ..... .206
Normal gain per machine hours 8.88
Sale price ..... $0.25 per lb.

Actual manufacturing cost, lb $0.237
Total actual cost ..... .248
Actual gain per hour ..... .40

better competitor than he would be if he was simply presented with normal cost records, charging Idle Hours to Loss and Gain or some other account.

It is possible, some may feel that it will entail too much time and labor to apply the expense caused by Idle Hours to the normal costs. If records are kept in the proper manner, the additional labor required in doing this would be slight and by far would be more than offset by the benefit derived therefrom.

A manufacturer who has this information before him will have the facts needed in basing his manufacturing and selling policies.

Power Plant Management

Principles of Lubrication—Part II

By ROBERT JUNE, M. E.

ATTENTION was called in our discussion in the June issue to the very great importance attaching to the proper selection of lubricants for the various services about a plant. It was stated that the importance did not lie in the opportunities to effect savings in oil, but savings in power, through reduction of friction losses. Sufficient emphasis can hardly be laid on this point, for discriminating choice of lubricants may result in savings in power sufficient to pay the oil bill several times over each year.

We have already dealt with the general characteristics of a good lubricant, and with chemical tests for determining the presence of impurities and adulterants. It remains to discuss the physical tests of lubricants and the qualities most desirable for various services.

The following are the physical tests of lubricating oils commonly employed:

1. Color, Odor and Specific Gravity: These are of value to the specialist in identifying the sample of oil, but they are of little practical value to the majority of operating engineers, and need not be described.

2. Flash Point: The flash point of an oil is that temperature to which an oil must be treated at a given rate so that enough fluid is freed from its surface to be momentarily ignited when a small flame is applied to it. The Cleveland open cup tester is the instrument commonly used for this purpose. A thermometer is suspended in the oil, which is slowly heated; the test flame is applied at every rise in temperature of 5 degrees F., until the flash occurs.

Flash point is determined as a measure of the oil's volatility. With steam cylinder oils it is of primary importance, the required flash point depending on the temperature of the steam at the engine. In the case of oil for bearings, flash point is important because it indicates the presence of volatile kerosene or naphtha with its accompanying fire risks. Plant blazes are always apt to occur with oils of low volatility, if used in bearings, and this possibility should be guarded against, if possible, in the selection of oils.

3. Fire Point: The fire point of an oil is that temperature to which it must be heated at a specified rate so that active combustion will take place, and continue, when the small flame is applied to its surface. Naturally, its temperature is above that of the flash point. It is usually found to range from 30 degrees F. to 65 degrees F., and in light lubricating oils, to about 40 degrees F. Fire point, like flash point, is of value when oils must be selected for service at high temperatures.

Cold Point: While the term "cold point" is commonly used, it is apt to be misleading, inasmuch as two cold points are commonly determined—first, the cloud point, which indicates the point of separation of the tiny particles of paraffine in oils of that base: second—the pour point, which indicates the lowest temperature at which the oil will run. These two cold tests are of value only where oils must be used under conditions of very low temperature and need not ordinarily be made.

4. Emulsion Tests are made in four runs: to 40 cc of oil in each case is added 40 cc of distilled water for the first run; 40 cc of brine for the second run; 40 cc of normal caustic-soda solution for the third run; and 40 cc of boiling distilled water for the fourth run. In each case the mixture is stirred with a paddle at very high speed—say 1500 revolutions to a minute. The oil should be kept at a temperature of 130 degrees F., during the test.

To pass this satisfactorily, oils used on ice machines or with forced lubrication, should completely separate in less than twenty minutes. The salt water and normal caustic-soda solution test need only be made where there is a possibility of water containing boiler compounds getting into the system. The boiling distilled water test is to be made only where there is a possibility of steam or water at high temperature getting into the oil system. The great importance of this test lies in the fact that where emulsification takes place with any type of forced lubrication, there will follow clogging of oil lines and a formation of solids in the base of the bearings, with consequent large losses of oil and greatly increased friction.

5. Viscosity: Viscosity is the most important physical test of an oil. It may be defined as a measure of fluidity or body. Its value depends upon the internal friction between the particles composing the

oil and their resistance to separation. Viscosity is really a measure of rate of flow of an oil at a predetermined temperature, through an orifice of standard size. It follows that the viscosity of an oil is inversely proportional to its fluidity.

Importance of Viscosity Tests as a Guide to Lubrication

All operating engineers have had bearings of machines under their care which increased in temperature when in operation to a certain point and remained at that temperature under normal working conditions. It is not uncommon to find bearings unusually warm and yet causing no worry or anxiety to the engineer in charge because he knows that these bearings will not heat to any higher temperatures. These conditions are not evidence of satisfactory lubrication, because frictional heat in a bearing is an indication of loss of power, due to excess frictional load; the power absorbed by friction having been transformed into heat. The causes of the high temperatures in the above described bearings may be credited to the viscosity characteristics of the lubricating oil in use. The viscosity of the oil was too high to give satisfactory results when the bearings were developing normal running heats, and therefore the bearing was required to develop sufficient heat to reduce the viscosity of the oil to a working value, which allowed it to freely flow into the bearing. With better circulation, the oil was able to balance the production of frictional heat by carrying it away as fast as it was created.

This example shows the necessity of using viscosity values, not as a direct guide to the selection of a lubricant, but as an indirect guide. The method of selection of an oil from its viscosity characteristics must be based on the temperature at which the oil will be expected to work, which in the case of a bearing will be the normal working temperature of the bearing. At this working temperature, the viscosity of the oil should fulfill the mechanical and lubricating requirements of the bearing.

By plotting the viscosity-temperature curve of an oil, this selection may be simplified and comparisons made quickly with other oils. An example of the practical use of this method is given as follows:

"Assume an engine bearing to have a normal running temperature of 105 degrees F. when the engine room temperature is 85 degrees. In this case, certainly no heat will pass from the air into the bearings. With the exception of the small amount of heat carried away by the engine frame, the 20 degrees excess temperature is a measure of the frictional heat developed in the bearing, and this frictional heat is a measure of wasted energy. If an oil is selected by means of its viscosity curve, produced from the same crude and having the same viscosity at 85 degrees F. that the oil in use has at 105 degrees F., the friction in the bearing will be reduced, because there will be no necessity for the viscosity of the second oil being reduced to meet the mechanical requirements of the bearing.

It is by far the most efficient practice to use an oil having the lowest viscosity that will insure the maintenance of the lubricating value of the oil.

Viscosity of Little Value in Steam Cylinder Lubrication

In the case of steam cylinder lubrication, the viscosity tests of cylinder oils have very little bearing upon the actual lubricating value of the oil.

It has become the custom of engineers and chemists to compare the viscosities of cylinder oils at a temperature of 212 degrees F. (by some at 210 degrees F.). A viscosity at this temperature is totally useless as an indication of the lubrication value of the oil, since no cylinder oil is ever called upon to work at this low temperature. Steam, at only 75 pounds pressure has a temperature of 320 degrees F., while at the usual pressures, the temperatures are much higher, as follows:

125 pounds to the square inch. .353 degrees F.
150 pounds to the square inch. .366 degrees F.
225 pounds to the square inch. .398 degrees F.

It has been found by actual tests that the viscosity of cylinder oils is practically the same at 400 degrees F. and upwards. Therefore, this test is as stated, of little practical value for cylinder oils, and attention is here called to it simply for the purpose of preventing a loss of time in making it.

6. Friction Tests: These are sometimes made in special testing machines, but the results obtained are of little practical value in widely varying conditions found in actual service.

From what has been said on the subject of physical tests of an oil, it will be seen that service tests must, after all, be the main, though not the only, reliance of the operating engineer; here different oils are tested out under actual working conditions and by the process of elimination. There are, however, certain general characteristics of oils best adapted for particular service and these we will take up briefly.

Steam Cylinder Lubrication: The chief requirements of a high lubricant for cylinder oil where superheated steam is used, are high flash-point and good body. Since there is practically no moisture with superheated steam, it is recommended that the lubricant be a straight mineral uncompounded oil of the highest possible viscosity and flash point. Where steam is not superheated, there is apt to be some condensation on the bottom of the cylinder. In order to aid the emulsification of cylinder oils with the steam, they may be sometimes compounded with "degras" (wool grease). The percentage of tallow allowable for the compounding purposes is from 3 percent for fairly dry saturated steam, to 10 percent for low pressure and wet steam and long uncovered lines

where the percentage of moisture in the steam will be high.

Cylinder oils should be fed into the steam lines at least three feet above the throttle valve, thereby insuring proper and complete atomization. Care should be taken that cylinder oils which have passed out with the exhaust steam and have been received by the hot well, do not enter the boiler with the feed water.

Notes on Bearing Lubrication

Hand Oiling: Hand oiling is very wasteful, as the oil can only be recovered by means of the drip pans. Grit and dirt often give considerable trouble when hand-oiling is used, and the close attention necessary to maintain any sort of efficiency from a lubricating standpoint, makes hand oiling dependent entirely upon the personal efficiency of the operator.

Oils for Circulating Systems: Lubricants used for continuous feed oiling should be strictly neutral, filtered oils. Paraffine, base, or treated oils should be avoided, because of the possibility of emulsification from the frequent churnings, and the possibility of moisture getting into the system, and from other sources.

Gravity Oiling Systems: Combination oil cups and sight-feed needle valves should be used at all points of lubrication. Oil cups should be kept full and ready for use in case the circulating system fails. In large installations, it is well to take a sample of the oil in use and from time to time take a test as the need for fresh oil can be quickly determined by noting the high viscosity. For all gravity feed systems, the point of entry of the oil to any bearing, should be at the point of minimum pressure.

Forced Feed Lubrication: Care must be taken not to introduce the oil into the bearings at such points that it will pass through low pressure areas of the oil films, causing counter currents in the films, and escaping without carrying off its proper share of frictional heat. Where plenty of oil is being circulated, probably the best place to introduce the oil is on one of the lower quarters. Lubricants used in all forced-feed oiling systems must be neutral, filtered and absolutely non-emulsifying. For the usual turbe-alternator installation, an oil of 150 to 180 Saybolt viscosity at 100 degrees F. will give the best results. The oils should have a low-gumming test and be free from all impurities. Treated oils are not satisfactory.

Ball Bearings: The lubricant used in ball bearings must be neither acid nor alkali, but must be neutral. A simple test for ball-bearing lubricants may be made by coating a highly polished steel surface with the oil or grease under observation. After exposing it to the heat of the sun for several days, any corrosive tendencies will be evident upon the polished surface of the plate. Oil containing any compounding of animal or vegetable oils should never be used in ball bearings, as it will produce gumming and become rancid. The best lubricant for these bearings is the strictly mineral oil. For high speed bearings, a light machine oil should be used, and for slower bearings, use a heavy viscous oil, or a straight petroleum grease. Petroleum greases have poor viscosities, however, and quickly run out of the bearings. Well-designed bearings are provided with suitable retainers for the purpose of holding the lubricant in the bearing and preventing its creeping out along the shaft. Engine grease or cup grease, should not be used in ball bearings unless it is carefully tested for the presence of free alkali, which will pit and corrode the bearing, if present. Greases should not be used in ball bearings running at over 1200 r.p.m. Graphite is not satisfactory for use in ball bearings because of its tendency to pack. Oil is the best all-around lubricant for these bearings.

Ball bearings should frequently be flushed out with gasoline to keep them clean.

Roller Bearings: Heavy body oil and medium grease should be used for the roller bearings when the speeds are low; but under normal conditions the speeds are high and will allow the use of machine oil. When oil is used, it should be strictly filtered and neutral, and free from any emulsifying tendencies.

Lubrication of Air Compressors: Air-compressor oils must be straight mineral oils and must not be too high in viscosity. They should be examined as to the nature and amount of the residue left after evaporation.

For compression temperatures of 350 degrees F. to 400 degrees F., the oil used should not flash below 500 degrees F., and where the temperatures do not exceed 300 degrees F. an oil of not lower than 400 degrees F. may be used.

When feeding lubricating oil to air-compressor cylinders care must be taken not to feed an excess of the oil, which will result in gumming and carbon-forming deposits.

Ammonia Compressor Cylinders: For the lubrication of the ammonia compressor cylinders, a pure mineral oil of good flash test (365 degrees to 400 degrees F.) and possessing a cold test of 0 degree to 5 degrees F., should be used. The heat of compression of the ammonia gas requires that the oil have a good flash test, since it must not vaporize too quickly. The possibility of oil leaking, or being carried in vapor form, with the ammonia gases into the condenser pipes and expansion coils, requires that the oil have a good cold test to prevent its solidifying in the piping. A fairly low viscosity oil should be used, one having about 100 viscosity to 100 degrees F.

Stuffing Boxes: Hot ammonia gas has a very bad effect on the stuffing box packing of ammonia compression cylinders. A liberal supply of lubricating oil should be applied at this point, to reduce the possibility of overheating the stuffing box.

Lost Capacity: One reason for lost capacity in refrigerating plants is due to the carrying over of the lubricating oil by the ammonia gases, and the

depositing of this oil on the interior of the condenser and expansion coils. This trouble is due largely to the common mistake of locating the oil separator entirely too close to the discharge of the compressor. The gases at this point are very hot and the oil is mostly in vapor form. If the separator is located near the condenser, where the gases have slightly cooled and some of the oil condensed, it is much easier to prevent an excess of oil being carried into the condenser coils.

Oil Traps: Oil traps, which may be made of a short piece of 3-inch or 4-inch piping, about two feet long, should be located at the lowest places in the expansion and condenser coils.

Measuring Oil Fed: All oil used to lubricate the ammonia compressor cylinders should be measured, and a record kept. If there is any unusual increase in the amount of oil fed into the cylinders, immediate investigation should be made, to prevent "filling" of the system.

Oil in Condenser Coils: If lubricating oil has gotten into the condenser coils, it can be loosened by cutting off the water from one stand at a time, and allowing the coil to become hot, when the oil will be thinned and can be run off at the oil trap.

Steam Cylinder Oils: Cylinder oils used in the steam cylinders of refrigerating machinery should be purely mineral, uncompounded oils. A mineral cylinder oil is more easily separated from the exhaust steam than a compounded oil. Either a filtered or unfiltered oil may be used. Absence of compound is the most important requirement to prevent the formation of an emulsion, with the consequent difficulty of removing this emulsion from the exhaust and condensed steam.

Motors and Dynamos

The same principles govern the selection of an oil for use in the self-oiling bearings of electric machines as is used in the selection of an oil for high-speed engines, having splash-feed bearings. The body of the oil will, of course, vary with the size of the machine. The viscosity should be as low as possible. The oil should have only sufficient viscosity to permit the rings to carry enough of it up to the bearings to provide ample oil for lubrication and should be sufficiently free-flowing to permit the free delivery of the oil from the rings to the journal. The viscosity of the oil must also be low enough to permit of its free circulation and cooling when it is in the reservoir.

Recent Improvements Made in Paper Mill of Abitibi Power and Paper Co., Ltd.

By W. H. ARTZ, Manager Paper Mill Section
Westinghouse Electric & Manufacturing Company

THE recent additions and improvements in the plant of the Abitibi Power & Paper Co., which have increased the capacity of this concern approximately over 100 per cent, mark another step in the progress of electric drive and automatic control for paper machine operation.

For a paper mill the Abitibi Power & Paper Co. is most advantageously located in the heart of one of the best combined waterpower and pulpwood districts known—Iroquois Falls, Ontario, Canada. Above Iroquois Falls lies the watershed of the Abitibi River, which embraces an area of 6,000 square miles, a large part of which is in the water surfaces of lakes and rivers. Lake Abitibi, with an area of 355 square miles, forms a storage pond immediately behind the company's power sites, and serves as an enormous reservoir for holding the flood waters and maintaining a uniform discharge of the stream.

Immediately tributary to Iroquois Falls is a forest area of over 6,000 square miles, containing immense supplies of spruce, poplar and other paper making woods, constituting one of the greatest virgin tracts of pulpwood remaining on the North American continent. Over one million acres of these pulpwood lands are now controlled by the company.

Iroquois Falls is also conveniently situated as regards railroad facilites, it being served principally by the Temiskaming and Northern Ontario Railway and its connections. The markets of the United States and Canada can therefore be reached with ease.

The company's mills are entirely of fireproof construction, equipped with the most modern and efficient machinery. The capacity is rated at 160,000 tons of finished paper per year, and a total capacity in salable products, including excess groundwood and sulphite, of 186,000 tons per year. The company devotes itself exclusively to the production of groundwood and sulphite pulp, and newsprint paper, practically all of which is exported to the United States.

From its own timber lands, the logs are floated down the Abitibi River to the mill, a distance of 50 to 100 miles. The timber is then conveyed into the mill where it is sawed into lengths of two feet and barked. After this operation a sufficient supply of the wood is conveyed to the groundwood mill where

both waterwheel and electric motor grinders reduce it to groundwood pulp. That quantity intended for sulphite pulp is chipped and screened into uniform size and then conveyed to huge digesters which have a capacity of 14 tons per charge. All the timber

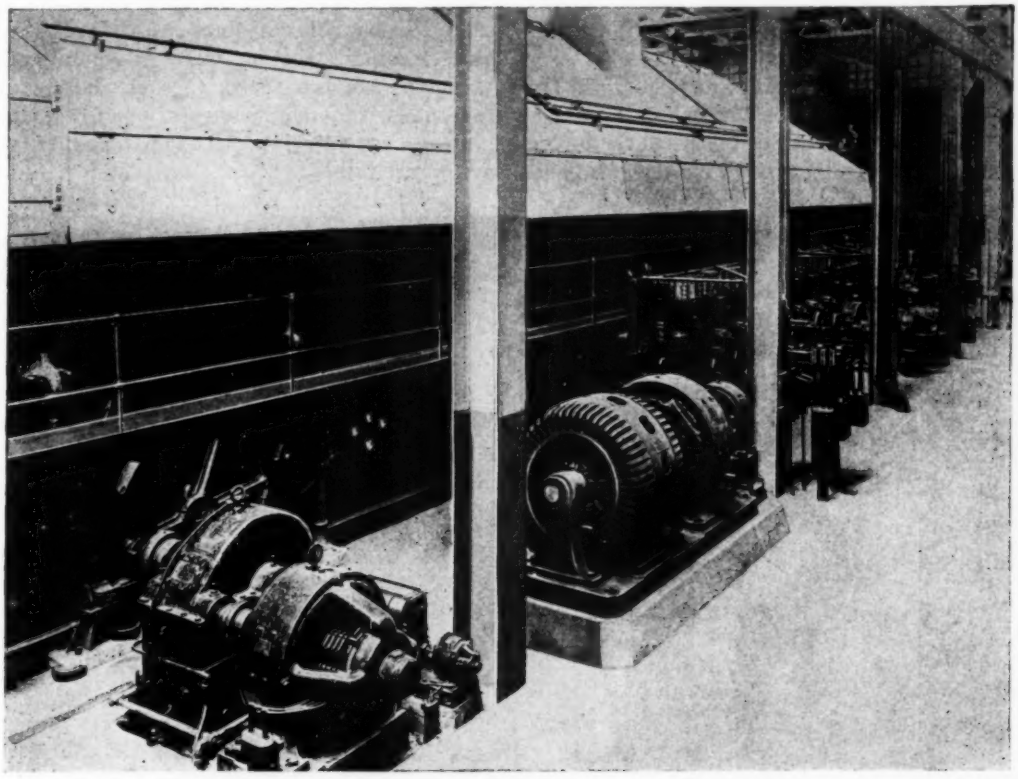


Figure 1

which is not immediately used for either of the operations described is carried by conveyors to the yard outside the mill. Most of the log driving is done in the spring when the ice begins to break and a strong current prevails in the river, so that the immense wood pile in the yard is depended on for supply during the greater part of the year.

With respect to the grinders it is interesting to note that the waterwheels which were formerly used to drive the generators of the old 6,000 horsepower plant will now be used to drive new pulp grinders, which, together with several electric motor driven grinder units, will add considerably to the capacity of the groundwood mill. The new power plant, located several miles up the river from the paper mill, has a capacity of 25,000 horsepower and transmits to the mill at 13,200 volts. A modern substation of similar capacity steps the voltage down to 550 for delivery to the A. C. motors throughout the mill.

After producing the groundwood and sulphite pulp, they are combined in the proper percentage, in large mixing tanks from which they ultimately reach the several paper machines.

The new 158-inch Pusey and Jones, Fourdrinier paper machine with Westinghouse sectional individual motor drive and automatically controlled speed regulation is of particular interest. The paper machine consists of a regular couch, three regular presses, two independent dryer sections not geared together, having respectively 16 and 14 60-inch drying rolls in addition to the felt rolls, one 8-roll calender stack and one English type uniform speed reel,

Figure 2

the winders being driven independently from the main part of the paper machine.

The drive and control of this machine which marks the most important recent improvement in the paper-making industry, solves one of the extremely com-

plex problems of paper-making operation. A paper machine which consists of mechanically independent parts covering several hundred feet of space may require a wide range in speed depending on the different kinds and grades of paper to be made. Since it is necessary to operate the sections at slightly different speeds, extremely close regulation is essential under all operating conditions.

For years paper manufacturers have realized the disadvantage and limitations of line shaft and rope drive and have been very active in the development of a means for their elimination. This has been successfully accomplished by the recently perfected system of sectional individual motor drive as described below. A few installations of multiple motor drive were made ten or twelve years ago, but with only partial success. This was due to the fact that it was not practical to obtain the same characteristics in the different motors, and in order to obtain the proper speed of the various sections of the paper machine, it was necessary to depend upon hand regulation of the motors.

The electrical equipment for the new paper machine described is designed for operating at speeds from 400 to 800 feet per minute and can be adjusted for still higher speeds if desired. Provision is also made for much lower speeds for such purposes as washing up and putting on felts, etc., in addition to the usual provision for inching.

The complete system consists of an adjustable voltage, direct current generator, of sufficient capacity to drive the entire paper machine, with direct connected exciter; a direct current adjustable-speed motor for each section of the machine; a Westinghouse reduction gear for connecting the motor to each section driving shaft of the paper machine; and a control system which automatically maintains the correct speed of each individual motor; together with push button stations for starting, stopping and adjusting the speed of the paper machine as a whole.

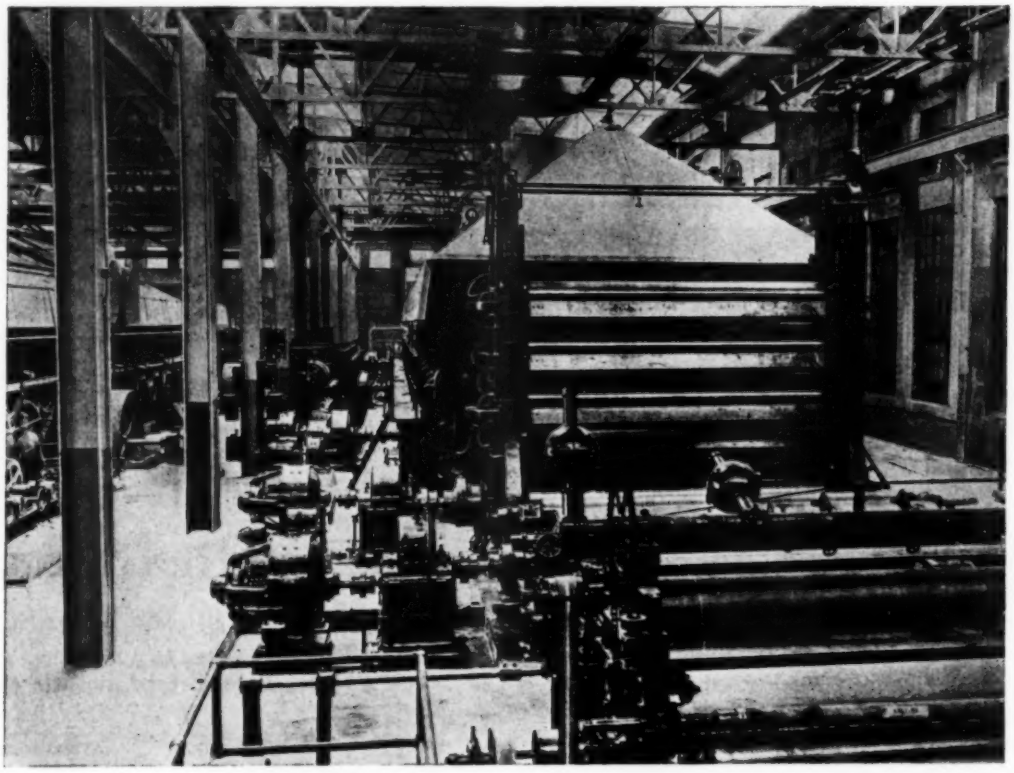


Figure 3

The generator forms part of a standard synchronous motor-generator set, and is 250 volt, adjustable-voltage, separately-excited machine, with a direct connected, 250 volt exciter of sufficient capacity to furnish excitation for the synchronous motor field, the generator and motor fields, and for the control circuit of the regulator. An illustration of the motor-generator set used in conjunction with this equipment is given in Fig. 1. The motors are 250 volt, separately-excited machines, having a 2:1 speed range by armature voltage control. In Fig. 2 may be seen one of the 75 horsepower adjustable speed driving motors mounted on a common bedplate with a Westinghouse herringbone reduction gear unit, to which the motor is coupled by a Bartlett Hayward flexible coupling.

The automatic control system consists of a small

master frequency generator, shown in Fig. 3 close to the third steel post from the foreground, driven by a small direct current motor operating in parallel with the section driving motors and separately excited; a small frequency generator driven from each of the section driving motors through a small speed changer consisting of two cone pulleys, to one of which the frequency generator is coupled; a powerful synchronous type of rotary relay for each driving motor, which serves to make an electrical contact in one direction or the other on the slightest unbalance of frequencies; and a motor-operated field rheostat, under control of the relay, in the shunt field circuit of each driving motor. The master frequency generator is common to all sections of the paper machine, whereas each section has its own section frequency generator, relay, and motor-operated field rheostat, together with an effective anti-hunting device. The section frequency generator and control speed changer may be noted in Fig. 2 on the same bedplate as the driving motor.

The small frequency generators are all excited by alternating current, but since the master and section frequency generators are excited from the same source, any variations in frequency or voltage of the exciting source have no effect upon the regulation, as they do not disturb the balance of frequencies at the rotary relay. Since no appreciable amount of power is required to operate the rotary relay, these frequency generators are small in size. The small speed changers referred to are of small size, as they do not have to transmit power, but simply overcome bearing friction of the small frequency generators and the friction of their own ball bearings, which is practically negligible. By shifting the small belt of these speed changers by means of a hand wheel, the relative speeds of the sections, or the draw of the paper, as it is called, is accurately and positively determined by the operator, and is thereafter maintained automatically at the correct value. Any unbalancing of the two frequencies at the rotary relay, caused by change in speed of the driving motor, immediately caused a positive synchronous movement of the relay, making an immediate contact and thereby adjusting the field strength of the motor, and returning the speed to the required value.

Before any governor or regulator can function, there must be a change of some kind, in either load or speed, as otherwise there would be no occasion for the regulator to correct anything. However, these changes in speed need not be large enough to be perceptible to the eye or detectable by ordinary indicating apparatus, to actuate this new regulator. In fact, the regulator will detect changes in speed of a few thousandths of one per cent, and make the necessary correction immediately, and without any tendency to overtravel or hunt, so that no perceptible change will be found in the draw of any section.

The control board, the rear of which is shown in Fig. 1, consists of a master control panel for the paper machine as a whole, controlling the generator and master frequency generator, and a unit section control panel for each of the section driving motors. Starting equipment is provided on each of these panels, consisting of motor-operated cam accelerating switches with line contractors under the control of suitable push button stations for starting and stopping the individual motors, and the entire paper machine as a whole. The master rheostat, under push button control provides means for adjusting the speed of the paper machine as a unit, over the entire range of speed. The rotary contractor relay and motor-operated rheostat for each section is also located on the unit section control panel. The push button stations mounted on the paper machine frame, provide convenient means for starting, stopping and obtaining any desired speed of the paper machine. The principle of this system of electric drive is exceedingly simple and no extended period of adjustment of the electrical equipment is necessary.

It is worthy of note in this particular, that two days after the Abitibi paper machine was started, it was placed on regular continuous commercial production, and the satisfaction of the mill operators and management indicates beyond question the efficiency and desirability of this drive and control.

The True Story of a Rejuvenated Mill

By H. V. COES
Ford, Bacon and Davis, New York City

A YEAR or more ago, a progressive Philadelphia business man acquired the controlling interest in a paper mill whose traditions and history is the history of fine paper making in this country.

The president's first act, after he was firmly settled in the saddle, was to have a valuation made of the property for the purpose of enabling him to form a sound basis for a modern cost accounting system, for income tax adjustment and for insurance purposes. He, subsequently, made the statement that he had more than paid the cost of the valuation in the savings in the first year's taxes.

The president had not been on the job very long before he began to notice that he was being called upon to sign requisitions for expenditures both for capital account and for operating betterments, extensions and replacements. Work that was done today proved, in a few weeks or in a few months, either

to be inadequate or illogical. This set him to thinking and he asked himself these questions:

Do I have a definite and comprehensive plan for the future development of my mill?

Am I spending money on buildings and equipment today that would form a part of a completely co-ordinated plant tomorrow?

Are my departments well balanced?

Will my manufacturing costs permit me to successfully compete under changing conditions?

The questions were all answered negatively.

Realizing the limitations of himself and those of his organization to make an impartial and comprehensive investigation so as to definitely answer these and many other similar questions, he again decided to retain competent engineers to assist him.

The engineers made a preliminary survey of the situation and outlined a plan and the scope for a comprehensive report. This was approved, and the engineers went to work along the following lines:

1. To lay out a comprehensive plan for the future development of the mill.
   - (a) Property required.
   - (b) Rail and water connections.
   - (c) Water and power facilities.
   - (d) Labor market.
   - (e) Housing and Community Center.
   - (f) Location with respect to supply of raw material and sale of finished products.
   - (g) General arrangement of buildings and departments.
   - (h) Types of construction best suited to the industry.
   - (i) Arrangement and selection of equipment.
   - (j) Co-ordination of all functions for efficient administration.
2. To provide a policy and schedule for expenditures for buildings, equipment and process betterments that would form a part of a completely co-ordinated plant at an estimated future date.
3. To provide for balancing departments. Arrangement and selection of equipment.
4. To provide for improvement in processes.
5. To completely solve the problem of handling of materials of all kinds.
6. To modify and improve existing operating conditions with respect to:
   - (a) Generation and use of power and steam.
   - (b) Organization to meet new conditions. Co-ordination of all functions for efficient administration.
   - (c) Determination of result of changing conditions in supply of raw materials.
   - (d) Logical program to meet competition because of changing conditions.
   - (e) Determination of profitable and unprofitable parts of the business with a view to eliminating the weak spots.

At the end of two months, the engineers reported to the president, who, after a conference with his board of directors, accepted the engineer's recommendations and asked them to make arrangements to carry out and execute their recommendations.

A review and analysis of the company's sales records for as far back as they could be traced furnished the basis for carefully estimating the past and forecasting the future growth of the business. With this data and the known physical limitations of the property, it was possible to lay out a definite plan for future extensions of all the departments and yet keep them in balance.

Every time a move is made now to take care of growth, it is made along well defined lines and adhering to a predetermined plan and policy leading ultimately to a completely rehabilitated plant, carefully co-ordinated, conceived along rationally broad lines, the final result being a plant developed within the economic and geographical limitations inherent in the location and the business.

The plant extension policy had to provide for the future location of not only manufacturing buildings, but administration, community center, emergency hospital and similar buildings. Provision had to be made for sewage and waste disposal; elimination of stream pollution. Areas were set aside and preserved for all these, together with an area for future housing development.

Very careful consideration had to be given to the question of whether the present raw materials of manufacture would continue to be those of the future and provision made in the plan to permit the handling, receiving and storing of such raw materials in the future as could, reasonably, be conceived to be usable for manufacturing purposes.

After having determined the logical future development of various departments, it was decided to revamp certain of the present buildings which were in need of extensive repairs. A new operating floor was installed above the digesters without disturbing production. Wooden supports for the digesters were in questionable condition and were replaced with steel columns. A new lower floor was installed; a large chip bin was erected above the digester operating floor, together with a conveyor and a new roof over the building, all this being done without interfering with operation.

In the boiler plants, boiler room, firing conditions were improved, the temperature of flue gases materially reduced and boiler feed water temperature considerably increased. Steam pipes and unprotected surfaces were properly insulated, radiation and condensation being thereby materially reduced. Steam leaks, which were stopped, helped to conserve coal, while the hot water which had previously gone to the sewer was returned to the heater system.

By rehabilitation of one of the stacks and a careful study of load apportionment, it has been possible to economically load up the most efficient of the two

boiler rooms, and to permit the curtailment of operations in the other one, resulting in savings in coal, maintenance and operating expenses. Altogether, these improvements, rehabilitations and betterments represented many thousands of dollars a year in coal saving alone. At a later date, a new power plant will be built in its proper location which will provide for the additional loads called for by the expansion of the mill and still further economies will then be effected.

The beaters were driven by a simple condensing engine through a complicated system of line shafting idlers, belting, gearing and other forms of mechanical transmission. The engine had been in service many years, and it had been decided to replace it with another unit. An economic study of the situation from all angles showed a material saving in operating and maintenance cost could be effected by motorizing the beaters and purchasing power from the local public utility. This was done and the saving of power costs alone of $20,000 for the first year's operation is expected.

The work of motorizing the beater room had to be so planned as not to interfere with production, or to damage the product in the beaters in the making. A switch board was installed, conduit run, foundation set of motors, everything properly arranged for and, at stated intervals, these motorized units were put into service, and the old mechanical transmission equipment removed.

A study of the handling of materials in and about the plant indicated the possibility of again materially cutting operating costs by the substitution of properly selected proven mechanical apparatus for the inefficient, unskilled labor.

There is every indication that the first year's operation of the unloading, piling, chipping and splitting of pulp wood alone will return a net saving of approximately $40,000. Every element of material handling equipment, which has been selected, has been chosen, not only to perform the work at present, but, in almost every instance, except in specifically isolated cases, to fit into the program conceived for the ultimate plant. In the same way, the handling of other materials has been taken care of and in each case the savings that can be made by careful planning and execution have been predetermined.

A schedule will be followed out step by step as quickly as funds are available, and as quickly as the work can be executed without interruption or dislocation of production.

Step by step, these improvements are being carried out through the co-operation with the mill organization in such a manner that the operating crew is able to concentrate upon operating problems, and is not required to dissipate its efforts by carrying the added burden of extensive planning for rehabilitation and construction which, in most cases, the operating organization, neither by training nor experience, is qualified to do.

Much assistance has been rendered the management in connection with the study of the personnel of the organization, the realignment of duties, the schedule of the work in order that the rehabilitated property might be efficiently operated.

The company now has plans and policies to go by that will insure complete rehabilitation and co-ordination. The officers know that every time an appropriation is made for plant betterment, extension or rehabilitation, that the expenditure is justified, will be made in harmony with expenditures made in the future, all focussing on the attainment of an ultimate ideal.

Screening

By JULIUS SCHROETER

PROPER mixing of clay milk and colors, followed by thorough screening and smoothing out of the mixture is an essential preliminary for the ultimate excellence of the finished product of the coating room.

The usual way of forcing these materials through a brass screen of fine mesh by means of a wire brush, driven by mechanical or man power, has this great disadvantage, that particles of grit and dirt, which should be kept out of the mass, are pushed through the spreading mesh and tends to mar the flawless beauty of the coated surface. These undesirable elements should be kept out of colors and coating material, and this is accomplished by a new machine which has recently been put on the market.

Figure 1 shows the open type Sandhog, as the electric vibrator is called, which has been used by the Western Shade Cloth Company of Chicago, for over two years.

The name originated from the enormous amount of moulding sand this machine devoured in the foundries, sifting a ton of moist sand in about four minutes, thus proving that its appetite fully equaled that of its namesake. The name is not quite inappropriate for paper mills, as it keeps the sand and grit away from coated surfaces and has really marvelous capacity for actual work.

Figure 2 shows the latest development of the Sandhog, a water-proof type with aluminum side outlet riddle, which delivers the screened product through a spout in its side, so that it may be gathered in a covered receptacle, insuring absolute purity.

Figure 3 shows this type of Sandhog at work at the wall paper mill of the Henry Bosch Company, Chicago, Ill.

The capacity of the machine is 5,000 pounds of

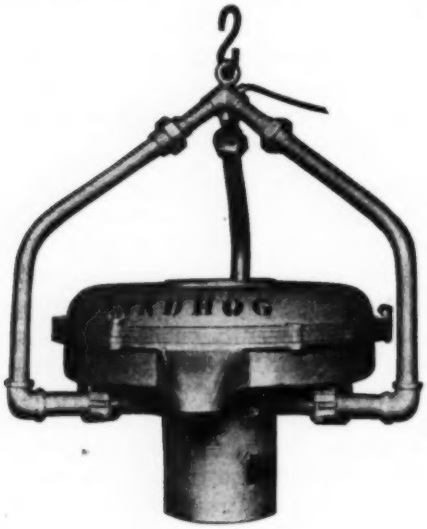


Figure 2

clay milk of 20° Beaumé through an 80 mesh screen in less than 45 minutes. It is rarely necessary to use a finer screen, because the material is not forcibly pushed through the mesh, but simply "Shimmied" through, and "What won't go through that way, ain't worth going through."

The machine is portable, and can be used to strain

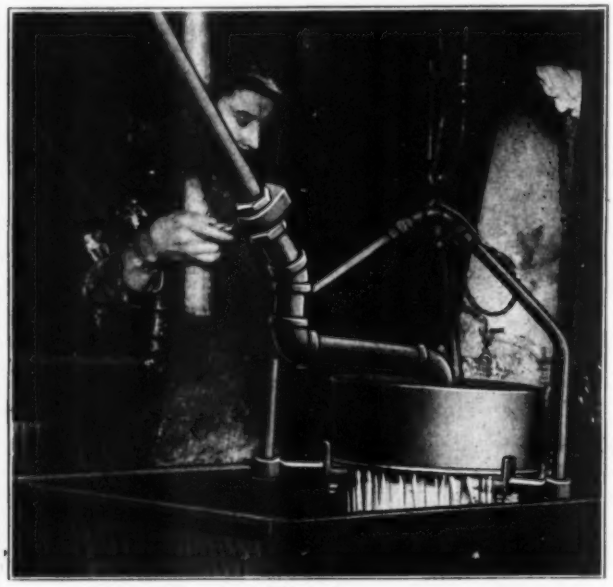


Figure 1

different kinds of material and colors, by simply clamping on another Riddle.

The machine weighs complete, about 75 lbs., and may be suspended by means of an iron rod or chain. It is arranged for connection to the ordinary incandescent light socket. The motor requires about ½ Ampere of current, and standard motors of 110 or 220 volts D. C. or A. C. of 25, 50, or 60 cycle, single

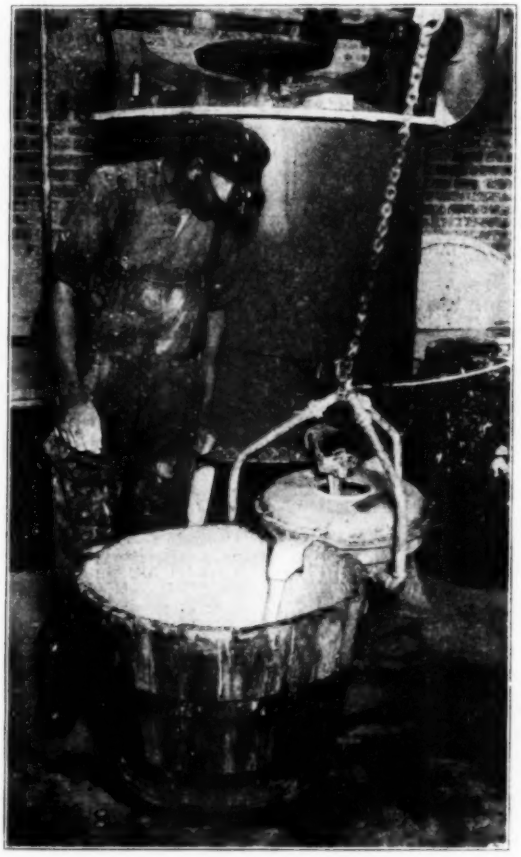


Figure 3

phase are furnished. The Sandhog cannot be used on 3-phase power lines.

The Falulah Paper Co., of Fitchburg, Mass., the Champion Coated Paper Co., of Hamilton, Ohio, The New York Consolidated Card Co., of Long Island City, N. Y., and many other large paper mills have already installed the Sandhog and are deriving excellent results from it.

The principle on which the Sandhog is built marks a new departure in motor construction. The remarkable power is derived from a rotating eccentric field revolving around a stationary armature, causing everything that is connected with the motor to describe a rapidly oscillating circle, and forcing matter resting upon it into a gyrating motion, and thereby accomplishing the desired work.

This new motor has been patented in the United States and foreign countries, and the Vibrating Machinery Company of Chicago controls the patents.

In 1920 there were 1,653 paper machines in operation in the United States. In 1921 there are 1,706, and in 1922 there will be at least 1,710 machines.

Seventh National Exhibition, Chemical Industries

THE Seventh National Exhibition of Chemical Industries was held at the Eighth Coast Artillery Armory, Kingsbridge road and Jerome Ave., New York City, September 12 to 17, 1921. It was on the whole a big success considering the state of dullness through which the chemical industries have passed during the past year. With few exceptions, the exhibitors who usuallly are in the habit of making great displays, reserved the same space and showed their wares in the usual elaborate manner.

The long journey involved in making the trip to the armory, which is situated as far north in the city as 225th street, had an effect on the number who usually attend the show, but at that the attendance was but slightly smaller than what was recorded last year at the Grand Central Palace. The character of the attendance was considerably different. Fewer people were there whose only interest is to gather all the literature they can obtain, but the volume and character of the inquiries received from the spectators was most gratifying to the exhibitors.

It was a source of great satisfaction to the exhibitors to learn that the Grand Central Palace is again available, and by a large majority they voted to hold the 1922 Exhibition in the old quarters. The chief merit of the Palace is its convenient location and it will be remembered that the Exhibition would have been held there this year but for the reason that it was intended to remodel the place into an office building and the owners refused to consider the Exhibition for 1921 on account of the proposed change.

During the week of the Exhibition, there were a number of symposiums held at which many papers of interest to paper and pulp manufacturers were read. As the product of a number of the exhibitors is used in this industry, a partial list of the exhibitors is herewith published, as follows:

ALBERENE STONE COMPANY.—Exhibit consisted of standard equipment for research and educational laboratories. All of the fixtures were typical of the work which has been installed by industrial plants, and in the laboratories of educational institutions, hospitals, and the U. S. Government Bureaus and Departments. Among the fixtures in the exhibit were found a complete Alberene Stone chemical hood, sink, drainboard and pegboard of Alberene Stone, and Alberene Stone strainer and over-flow; Alberene Stone table tops for work benches, gutters and reagent shelves.

ALLIS-CHALMERS MFG. CO., INC.—Operating models of dust collector, pulverator, motor-driven bronze pump, rubber-lined pump, direct current and induction motors, and air compressors.

AMERICAN HARD RUBBER CO.—Chemical handling and conveyance equipment of hard rubber, including pumps, pipe fittings, tanks and utensils.

AMERICAN LAFRANCE FIRE ENGINE CO., INC.—Industrial safety devices, including the latest developments in breathing and eye protection for workers in chemical factories.

AMERICAN STEAM PUMP CO.

AMERICAN WATER SOFTENER CO.—Exhibited a model on reduced scale of a 10-ft. diameter pressure sand filter, and a 10-ft. diameter DecAlso Pressure Zero water softener with salt tank.

ARNOLD, HOFFMAN & CO., INC.—Oils, water softeners, gums, starches, dextrines, pigment colors, caustic soda and liquid chlorine.

BAILEY METER CO.—Various types of Bailey fluid meters for measuring steam, water, gases and chemicals; V-notch weir meters having capacity of 60,000 lb. per hr.; specific gravity recorders, draft gages and a differential gas pressure recorder accurate to 1/10,000 in. of water.

BARRETT CO., THE.—The exhibit of The Barrett Company, manufacturers of refined coal-tar products, was, as usual, held in conjunction with those of the other companies with whom it is associated in the Allied Chemical & Dye Corporation, namely, The General Chemical Co., National Aniline & Chemical Co., Solvay Process Co. and Semet-Solvay Co. Exhibit was made of the widely known "Barrett Specification" roofs and various forms of prepared roofing and building accessories of which this company is one of the largest manufacturers in the country. The use of Tarvia for road-building was shown. Another exhibit illustrated the use of Barrett's Carbasota and other creosote oils for the preservative treatment of wood. The value of wood preservation was demonstrated by actual samples of creosote and untreated wood which had been subjected to the same ageing conditions.

BLAW-KNOX COMPANY.—Outstanding exhibit as far as theatrical demonstration was concerned, was the erection of their Prudential Section Steel Buildings, 6 ft. by 6 ft. 6 in. by 8 ft., this size being known to the trade as a "Handy House" because of its universal application. This was a building representative of their line, which includes sectional steel buildings running from 5 to 60 ft. clear spans, in any length and not more than 12 ft. high to the eaves. Exhibit was also devoted to the exploitation of forge and hammer welding methods of joining steel plate. By this method the ends of parts to be joined are overlapped, heated by a non-oxidizing gas and welded through the use of patented machinery, including air hammers and anvils, to make a joint which is practically as efficient as the original plate. This is the only method by which bottle tight steel plate products can be made.

BRISTOL COMPANY, THE.—Exhibited recording thermometers, such as are used for taking the temperatures in sulphite digesters, and recording pressure gauges for recording the pressures. An electric recording tachometer suitable for use in taking the speed of paper mills, and indicating and recording pyrometers which are used so extensively for sulphur burning and also on lime kilns were given a prominent share of space.

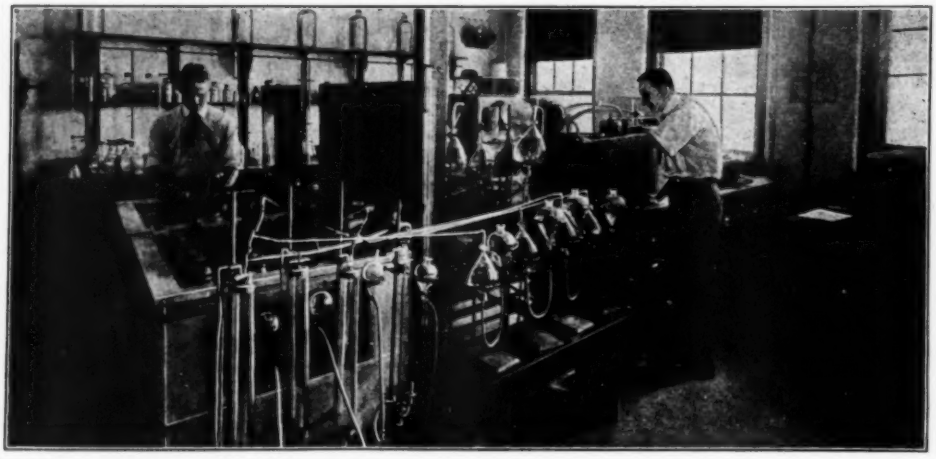
BROWN INSTRUMENT CO.—High- and low-temperature measuring instruments, including indicating and recording pyrometers, recording thermometers, resistance thermometers, indicating and recording instruments for pressure, vacuum, time and operation.

BUFFALO FOUNDRY & MACHINE CO.—A full line of vacuum driers, evaporators, chemical apparatus, sugar apparatus, etc., showing new developments in Buflovak and Buflokast apparatus.

CALCO CHEMICAL CO.—Had a very attractive exhibit showing their coal tars, intermediates, dyestuffs and pharmaceuticals, of which they are large producers. The Calco Chemical Co.'s plant consists of 57 buildings on an area of 250 acres of land, which six years ago consisted of a large farm.

CARRIER ENGINEERING CORPORATION.—Air-conditioning equipment, including complete automatic temperature and humidity control.

CENTRAL SCIENTIFIC CO.—DeKhotinsky constant temperature appliances, oil- and fuel-testing instruments, high-vacuum



In this laboratory, solubility research is conducted on the materials used in the production of dyes as well as the products of the intermediate processes.

One Building of the Jackson Laboratory Group for Dye Research

Solubility of Dyestuffs

The solubility of a dyestuff is one of its most important qualities. A dye which is perfectly soluble, in the vast majority of cases, is one that has been prepared from pure intermediates by the correct formula.

But an intermediate to be pure must also be perfectly soluble, the while being free from all foreign soluble matter. Very often the only way of separating two or more intimately associated chemicals is by taking advantage of the differences in their solubilities.

Purity, solubility and identity are qualities possible in every chemical compound, but they are interdependent.

The purity and solubility of DuPont Dyestuffs are the result of a thorough knowledge of all the qualities of the chemicals that go to make them. Note their solubility.

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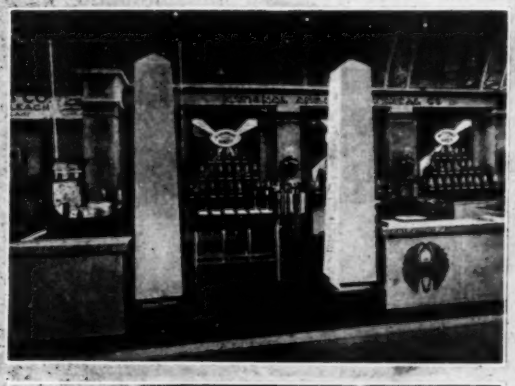

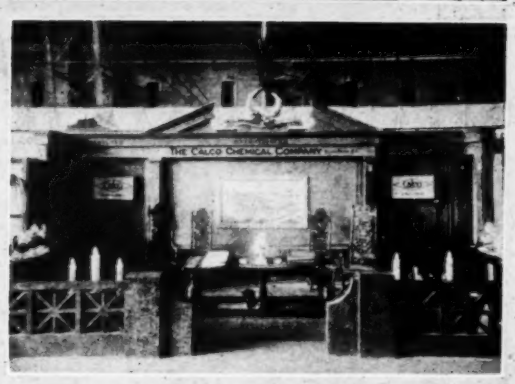

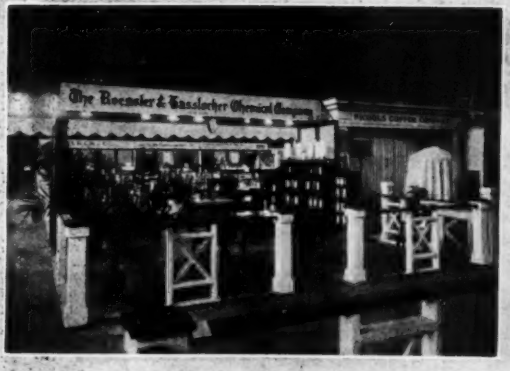

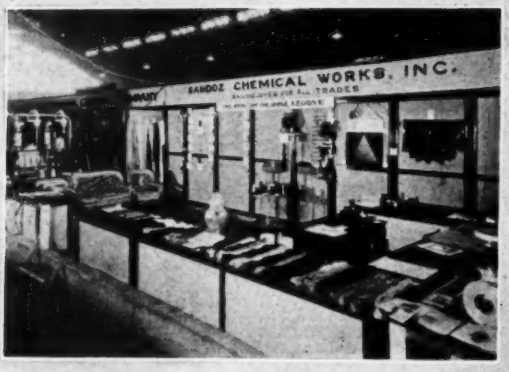

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pumps, electrical appliances for the laboratory and various analyzed chemicals.

CHEMICAL EQUIPMENT CO.—Ceco acid-resisting valves, pumps and sprays, vacuum evaporators and tank car unloading systems.

CLIPPER BELT LACER CO.—Three different types of belt lacing machines will be exhibited and also the application of the different sizes of belt hooks to all kinds of belting.

CRANE CO.—Exhibit consisted of a large line of valves, cocks, fittings and specialties in brass, iron, ferrosteel and cast and forged steel for all pressures up to 6,000 pounds per square inch. A metallurgical exhibit showed the composition by weight and volume of the various metals used in the manufacture of Crane goods, and sectioned samples illustrated the design and utility of the manufactured articles. Other specialties that attracted special attention were the Crane Automatic Stop Check Valve; the Crane-Erwood Double Acting Non-Return and Emergency Cut-out Valve; Crane Separators and Boiler Blow-off Valves and Extra Heavy Cast Steel and Forged Steel Valves.

DAVIDSON COMPANY, M. T.—Manufacturers of steam pumps, One of the special features of this exhibit was the "Davidson" non-contact acid pump, the detailed construction of which was illustrated by parts mounted so as to give a clear idea of the method of operation of this machine, which is unique. The small working model of the "Davidson" pump was operated by compressed air and running at varying speeds, and throwing a stream of water which, though small, showed the steady action of the "Davidson" Simplex Pump.

DETROIT CHEMICAL WORKS.

DEVINE CO., J. P.—Illustrations of installations of several different types of apparatus, including a large quadruple effect vacuum evaporator having 26,000 sq. ft. of heating surface, a complete installation of a vacuum chamber drier with material being dried on the trays, and complete with the auxiliaries—i. e., surface condensers and dry vacuum pump.

DIAMOND STATE FIBRE CO.—A full line of vulcanized fiber sheets, rods and tubes, and also a new waterproof insulation, Condensite Celoron.

DINGS MAGNETIC SEPARATOR CO.—Exhibiting the laboratory apparatus known as the Magnetic Tube Analyzer, which is used for determining the amount of magnetic material in any substance which is concentrated magnetically.

DORR COMPANY, THE.—Exhibit included the various Dorr machines which are used for continuous causticizing. The Dorr Classifier, similar to that used for the removal of the grit from the milk of lime, was shown in actual operation, removing grit and coarse granular material from a feed which consisted mainly of finely divided solids. A Dorr Agitator, which is used for the reaction step of the causticizing process, was also included. A small continuous Thickener was shown in actual operation, treating a chemical pulp. The major portion of the liquid in the feed to the Thickener was removed as a clear overflow, while the solids were removed continuously from the bottom as a thick sludge. In the causticizing operation, three machines like this latter one are operated in a series for a separation of the caustic liquor from the lime mud. A Duplex Dorrco Diaphragm Pump, which is used for the removal of the lime sludge from the Thickeners, was also shown.

DOW CHEMICAL CO.

DU PONT, E. I. DE NEMOURS & CO.

DURIRON CO.—Centrifugal and reciprocating pumps, exhaust fans, kettles, valves, cocks, pipe and fittings, laboratory apparatus and various other equipment designed to carry corrosive materials.

ECONOMY ENGINEERING COMPANY.—Economy tiering machines or portable elevators, both band and electrically operated types, and also a new little lifter, which is a machine designed to be operated from the ordinary lamp socket and meets with the approval of the underwriters. All tiering machines exhibited were designed for piling packages such as rolls of paper, bales, bundles, cases, barrels, etc.

ELECTRO BLEACHING GAS CO.—Exhibit of liquid chlorine and of textiles and pulp bleached with this product.

FLEISHER & CO., W. L., INC.—Exhibiting a spray drier in operation with samples of various materials which have been spray dried; also air-conditioning apparatus.

FOXBORO CO., INC.—Indicating and recording instruments such as thermometers, gages, carbon dioxide recorders, liquid level gages and temperature controllers.

FREEPORT SULPHUR CO.

GEIGY CO., INC., THE.—Interesting novelty exhibit giving a two-act play showing how Geigy Co. made prompt service in their organization.

GENERAL CERAMICS CO.—A complete line of chemical stoneware, standard shapes and forms of fused silica, and a display of magnesia ware.

GENERAL CHEMICAL CO.—This company's products will be exhibited in one of the booths constituting the Allied Chemical & Dye Corporation's exhibit. Baker and Adamson laboratory chemicals and the Herreshoff roaster furnace will be shown.

GENERAL ELECTRIC COMPANY.—Exhibit was confined principally to some of the uses of electricity in the industrial application of heat.

A large furnace with automatic heat control was in operation. This furnace was suitable for any heat treating process requiring temperatures below 2000° F. Many processes in the manufacture of chemicals and dye stuff requiring heat find it advantageous to use electricity instead of steam or gas and the many heating devices shown suggested a wide field of application.

GLAMORGAN PIPE & FOUNDRY CO.—The exhibit will consist of the following apparatus: A standard direct-motor-driven nine-compartment rotary vacuum filter, a standard duplex direct-motor-driven vacuum pump, a 3-in. high-frequency turbine pump, direct-motor-driven, a standard direct-motor-driven caustic flaker, and a working model of a continuous discharge gas-fired vertical limekiln.

GLENS FALLS MACHINE WORKS.—Iron, brass and bronze foundry, paper and pulp machinery. A feature of the exhibit will be the rotary sulphur burner.

GOULDS MANUFACTURING CO.—Exhibited most every kind of a pump, centrifugal, pyramid, triplex, rotary pumps, and their new pump, the auto water system for residence use.

GRAVER CORPORATION.—Exhibiting models of water-softening equipment, water filtering equipment and photographs of acid, chemical and oil storage tanks; also other installations of special steel plate work.

GRINNELL CO, THE.

HANOVIA CHEMICAL & MANUFACTURING CO.—Quartz glass laboratory wares, special apparatus of quartz glass for laboratory processes, electric resistance furnaces for laboratory use, mercury-vapor arc lamps for various chemical processes —e. g., bleaching, dyeing and testing of colors, oils, etc., laboratory thermometers with platinum spiral inclosed in quartz glass.

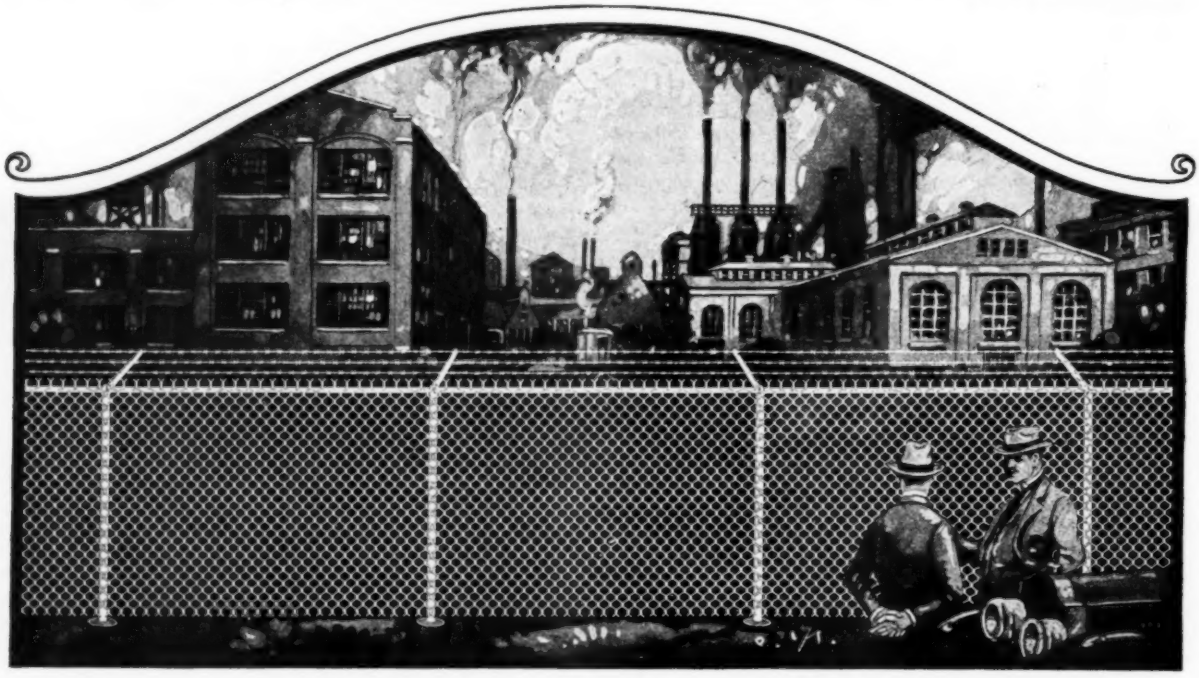
HAUSER-STANDER TANK CO.—Exhibiting a cylindrical shaped agitator tank designed especially for chemical use; also a rubber-lined cylindrical tank for the storage of muriatic acid. Other equipment of interest to users of wooden tanks will also be exhibited.

HOOKER ELECTROCHEMICAL CO.—An exhibit of the various chemicals that can be manufactured electrolytically from salt, with various samples of caustic soda, bleaching powder and liquid chlorine.

HUYCK, F. C. & SONS.—Operating the Kenwood Mills. Exhibiting Kenwood all-wool filter cloth.

INDUSTRIAL FILTRATION CORPORATION.—Exhibiting a continuous rotary filter in operation with the necessary tanks and

CYCLONE FENCE



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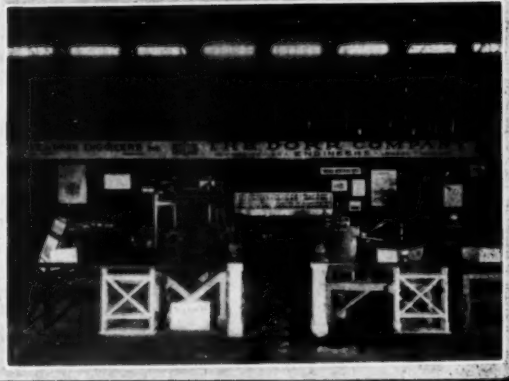

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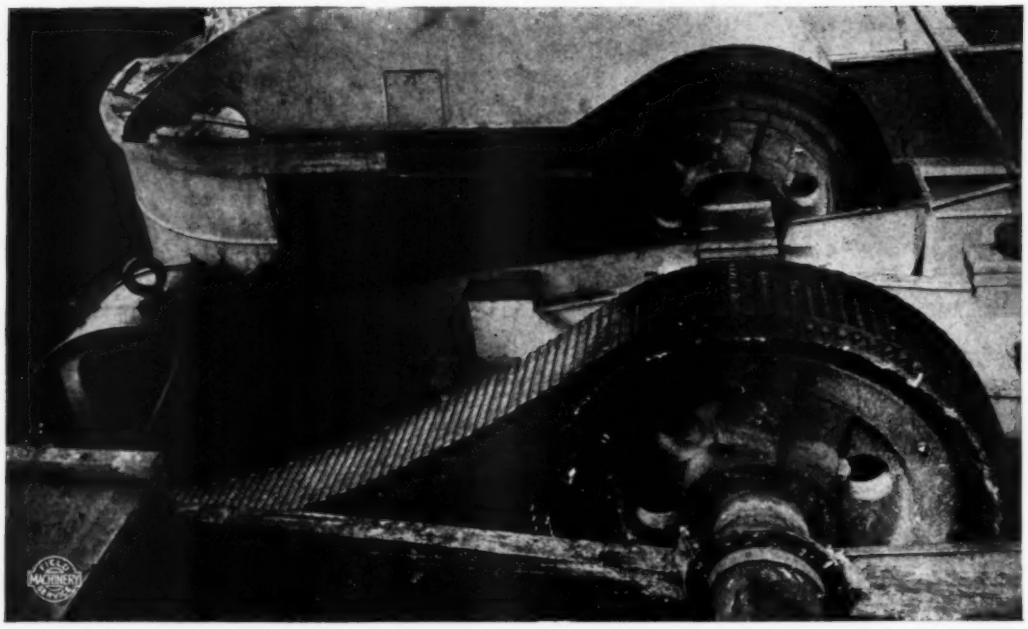

Chains Used to Drive "Beaters" in a Paper Mill Work 24 Hours a Day, 6 Days Per Week

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Our engineers are power transmission experts with years of experience. They are ready to study and analyze your power transmission problem and will tell you frankly whether or not Morse Chain is the solution.

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"Morse" is the Guarantee Always Behind the Efficiency, Durability and Service

pumps, a small-size continuous rotary hopper dewaterer, and a model of the open-tank type of filter.

INNIS, SPEIDEN & CO., INC.—Will exhibit a complete line of industrial chemicals, including photographic chemicals, dye intermediates, talc, casein and milk products and various heavy and fine chemicals of domestic and foreign origin.

KELLOGG CO., THE M. W.—Exhibit two 36-inch forge welded chemi-steel annealing pots, one of which had done service for about 500 hours and the other had done service for about 5,000 hours, at temperatures ranging from 1,500 to 1,600 deg. F. In neither of these pots was the weld visible. Many photographs of Kellogg forge welded chemi-steel products were on exhibit, including all sorts of chemical apparatus such as autoclaves, nitroters, kettles of all sorts and wood pulp digesters.

KLIPSTEIN & COMPANY, A.—A note of quiet elegance was struck by the Klipstein exhibit, which unquestionably proved restful and refreshing to many after the heat and bustle of the aisles. Of especial interest to the dyer were fast color specialties placed upon the market since the last show, which included Thio Indigo Red B, a very fast pink; Vat Yellow R, Vat Dark Blue and Hydron Blue—all vat dyes. Other new colors shown by Klipstein this year consisted of Meldola Blue, Sulphur Black W and Zeta Red Brown 3R. These specialties also included such important colors at Zota Black, for hosiery, chrome Black E. H. K., Sulphur Greens, Sulphur Brown BF, Sulphur Cutch, Sulphur Blues, Tartrazine N, Tartrazine N Extra Conc., Auramine O, Auramine OO Conc. and others.

KNIGHT, MAURICE A.—Exhibited acid-proof chemical stoneware of all shapes and sizes.

LAKE ERIE CHEMICAL WORKS, THE.—Exhibited Tungstic Acid and Sodium Tungstate (hydrated and anhydrous).

LEAD-LINED IRON PIPE CO.—Exhibiting lead-lined iron pipe, fittings, valves, stop cocks and block-tin-lined iron pipe and fittings.

LITTLE, ARTHUR D., INC.—Interesting exhibit showing a number of subjects as examples of this organization's work in the fields of chemistry, engineering and business management. "A. D. L." quantitive filter paper. Process exhibit, separation of 3 in C from complex area, and a study of available economies in the fuel situation. A silk purse made from a sow's ear, which attracted much attention.

LUNGMOTOR CO.—Exhibiting a simple resuscitating device for use in cases of gas or fume or smoke poisoning, or in apparent drowning or in electric shock collapse, etc.

LUNKENHEIMER CO., THE.—The display will consist of valves, boiler mountings, oil cups, grease cups, lubricators, oil pumps and similar products used in the engineering field. Valves constructed of bronze, nickel, alloy, cast iron, Monel, electric furnace cast steel and special non-corrodible alloys adapted for the chemical industries will be shown.

MAGNESIA ASSOCIATION OF AMERICA.—Exhibiting samples of 85 per cent magnesia pipe and boiler covering, magnesia blocks and lagging for hot steam surfaces, magnesia plastic, and samples of carbonate of magnesia.

MATHIESON ALKALI WORKS.—Exhibiting soda ash, caustic soda, bleaching powder, liquid chlorine, bicarbonate of soda, sesquicarbonate of soda, and various chlorine solvents, such as tetrachloride, ethylene chloride, etc.

MANHATTAN RUBBER MFG. CO., THE.—Exhibited Condor Red Friction Surface Belt operating in hot water. The same belt ran ten hours per day for one week at a temperature of 140 deg. F. Exhibit also included hard rubber lined and covered metal containers. The hard rubber coating being designed to protect the metal against acid and acid fumes. A large rubber lined and covered centrifugal was in operation. A complete line of rubber goods was displayed, including conveyor and elevator belting, water, steam, air, oil, garden, fire hose and other kinds of hose. A particular feature was a cotton rubber lined fire hose coated on the outside with an acid resisting rubber for use in plants where acid fumes are found. There was exhibited various kinds of machinery packings.

MONO CORPORATION OF AMERICA.—Exhibiting automatic analytical and recording apparatus for the analysis of oxygen in hydrogen gas, hydrogen in oxygen gas, chlorine in chlorine gas, carbon monoxide in producer gas and sulphur dioxide for the sulphite industries.

MONEL METAL PRODUCTS CO.

MORSE CHAIN CO.—Exhibiting a number of samples of different size chains, showing the Morse rocker joint, ranging in size from ⅜-in. pitch to 3-in. pitch and in several widths illustrating the chain as used for ½ hp. to 5,000 hp.

NASH ENGINEERING COMPANY, THE.—Practically all the machinery shown was in actual operation, and the display included Nash Hytor air compressors and vacuum pumps, Jennings Hytor return line heating pumps, both motor and steam turbine driven, and Jennings condensation pumps and receivers. In addition, there was introduced a new pump, known as the Jennings suction centrifugal. This machine is adapted for handling large quantities of liquid with a direct lift of 15 feet and delivering against from 20 to 50 feet of head, depending on the type of pump. One of the unique features of this centrifugal pump is that it never requires priming, and even substantial quantities of air introduced with the water have no effect upon its operation. The pump cannot become air-bound, even when liquid comes over in slugs. Another unique product was shown in the form of a small return line heating pump designed for 4,000 square feet of direct radiation, which only occupies about two cubic feet of space.

NATIONAL ANILINE & CHEMICAL COMPANY, INC.—Exhibit showed remarkable advances that have been made in the manufacture and development of coal-tar dyes. The setting of the exhibit was of a novel and artistic character. It was essentially Egyptian in design and was embellished with ornamentation carrying out this main idea.

Besides presenting a comprehensive collection of coal-tar dyes adapted to every conceivable use, there was shown a variety of coal-tar intermediates that proved of interest. There was in operation a complete working unit of a colorist's laboratory where visitors to the exhibition saw the operation of dye testing carried out in all their varied details.

NATIONAL RESEARCH COUNCIL.—An exhibit intended to show the necessity for fundamental chemical research, and the relation of organic chemistry to peace- and war-time industries.

NEWARK WIRE CLOTH CO.—A display of wire cloth of all grades, metallic filter cloth and testing sieves.

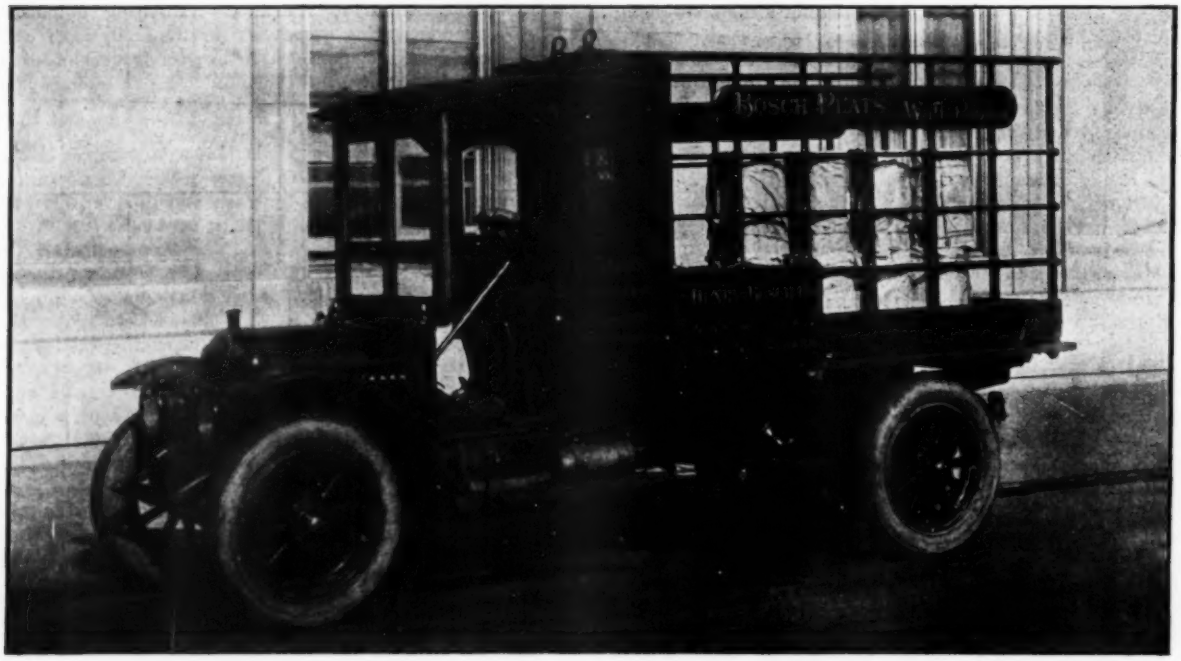
NEW ENGLAND TANK & TOWER CO.—This exhibit will show a complete outfit, in operation, including tank, stirrer and direct-connected motor-driven agitator. Different types of stirring equipment and of apparatus for transporting semi-liquids and liquids will also be shown.

NEWPORT CHEMICAL WORKS.—Exhibit was very attractive—laid out in well displayed color designs. A feature was their slogan of "Coal to Dyestuffs."

NEW YORK CENTRAL IRON WORKS CO., INC.—Exhibiting photographic views of steel tanks, stacks, breechings and chemical equipment of all kinds.

OBERMAYER, THE S. CO.—Hott-Patch furnace cement for power and chemical plants. A small electric furnace will be used for demonstration of the product.

OLIVER CONTINUOUS FILTER CO.—An Oliver Continuous Filter of iron and steel construction, with monel metal cover, handled soda pulp during the week. Stock was discharged from the Oliver in a smooth, unbroken sheet, ½" to ¾" thick, and the width of the filter drum, at the rate of 12 ft. per minute. Capacity ranged from 500 to 700 lbs. bone dry fibre per sq. ft. of filter area in 24 hours: i. e., the Oliver, which had 9 sq. ft. of filter area, discharged 3 tons bone dry pulp per day of 24 hours. A standard paddle type Oliver



One of 13 White Trucks owned by the Henry Bosch Company, of Chicago

Eleven-year-old Whites Still Serve Paper Manufacturer

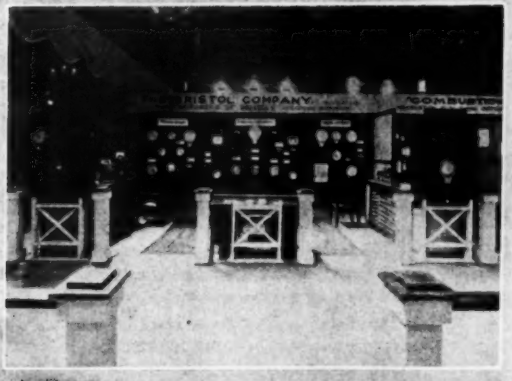
THE Henry Bosch Company, wall paper manufacturer, of Chicago, purchased two White Trucks in 1910 and two more in 1911. All four are still giving economical service although each has now covered 120,000 miles. As a result of the excellent performance of these veterans, more Whites have been installed as needed. A fleet of thirteen is now in operation.

"We have operated White Trucks in our delivery service since 1910," reads a letter from this concern. "Our old ones are still in service, despite the hard work to which they have been subjected. We have always found them efficient, economical and dependable."

White Trucks are known everywhere for their ability to give economical, dependable service over a long period of years. Hundreds have mileage records of 100,000 to 300,000 miles and more. Spread over such mileages, the purchase price is a small item. The recent reductions in White prices make the White Truck a better investment today than ever before.

THE WHITE COMPANY
CLEVELAND

White Trucks



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ARTHUR D. LITTLE, INC.

THE W. S. TYLER COMPANY
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THE BRISTOL COMPANY
LAKE ERIE CHEMICAL WORKS

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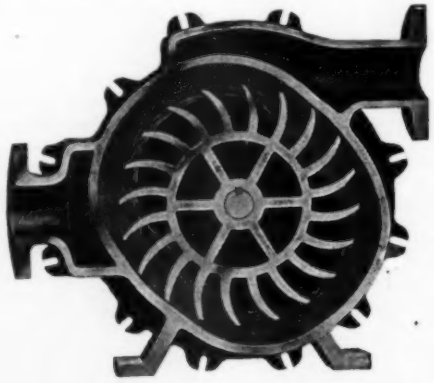

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The Nash Engineering Co.
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New England Representative
G. H. GLEASON
141 Milk St.,
Boston, Mass.

and Oliver parts of various metals were exhibited, and two models of Oliver-Sherwood acid and alkaline Olivite pumps were on display. Various uses of the Oliver for washing digested wood pulp, dewatering and washing lime mud in causticizing departments, recovering stock from white water, etc.

PENNSYLVANIA SALT MFG. CO.

PERMUTIT COMPANY.—Exhibited a model of water softening and filtering equipment. It is about four feet long and made exactly to scale after the design of a large unit that delivers 100,000 gallons per day. Even the small pipes and strainers in the interior of the water softening tank have been reproduced in miniature and the model represents a very striking and clever piece of workmanship. The Permutit Company manufactures all types of equipment for treating water to render it pure, soft and correct for use in all branches of the industry.

PHILADELPHIA DRYING MACHINERY CO.—An exhibit of the various types of Hurricane drying machines, including the cabinet tray drier and truck tray drier. Also a photographic display of various installations.

PNEUMERCATOR CO., INC.—A display of a complete line of gages for the indication of depth, weight, volume or specific gravity of any liquid stored in tanks at any pressure.

PRECISION INSTRUMENT CO.—Exhibiting a general line of boiler room and gas plant specialties, including the precision single and multiple indicating and recording gages, combustion recorders, orsats, gravitometer, calorgraphs, etc.

PROCTOR & SCHWARTZ, INC.—Exhibiting a model of the Proctor driers for drying colors, chemicals, raw stock, soap, etc. Samples of all kinds of materials dried in Proctor driers will be exhibited and a projectiscope will show various installations in representative chemical plants.

QUIGLEY FURNACE SPECIALTIES CO.—Materials and equipment for furnace construction and operation, including a high-temperature cement for bonding fireclay and silica bricks and blocks, as well as granular refractories, a specially prepared cellular refractory brick used in insulating furnace structures for the conservation of heat, and a highly refractory fire sand used with a suitable binder for making rammed-in linings for furnaces, special tile, patches and repairs. The Quigley powdered coal system will also be demonstrated.

ROESSLER & HASSLACHER CHEMICAL CO.—Exhibited a large number of chemicals applicable to most every kind of industry.

SARCO CO., INC.—Sarco temperature regulators for tank, room and kiln control. Sarco steam traps for low and high pressure. The new Sarco radiator trap Type "E" and the new Sarco (Fournier) indicating thermometers for chemical and industrial purposes.

SANDOZ CHEMICAL WORKS, INC.—While this company displayed only their American-made dyes, the exhibit was nevertheless a very striking one and was admired by the great majority of visitors. It showed first a series of natural raw materials, such as coal, salt, sulphur, saltpetre, lead ore, together with air and water, which, by manufacturing processes, yielded crudes, acids, alkalies and intermediates, which, in turn, united to form the dyestuff Orange II. The legend over all was, "The story of a simple Azo dye," but this one simple dye then gave the color for a long list of manufactured products. Paper was shown colored in the beater, on the calender, as tissue, coated and printed with orange-colored lithographic ink.

SCHAEFFER & BUDENBERG.—A complete line of efficiency-promoting instruments, such as indicating and recording gages, indicating and recording thermometers, counters, tachometers, calorimeters, etc.

SCOTT, ERNEST & CO.—Photographs showing a number of installations which have been furnished to various trades and are used for reclaiming chemicals of value from factory waste liquor, deposits, etc. The apparatus illustrated by the photographs will consist of: Vacuum evaporators as used by the soap trade for recovering glycerine from waste spent lyes, paper pulp mills for recovering the caustic alkali from waste black liquors, and by many other manufacturers for reclamation purposes.

SHERWIN-WILLIAMS CO., THE.—The manufacture of paints, varnishes, dyes, chemicals, pigments, coal-tar products, insecticides, etc., will be illustrated by exhibits of important raw materials, samples of the finished product and examples of merchandise finished with these products.

SULLIVAN MACHINERY CO.—Working models of the Sullivan air lift and displacement pumps.

SWENSON EVAPORATOR CO.—Swenson evaporators and equipment.

C. J. TAGLIABUE MFG. CO.—Exhibit had many features of unusual interest. The oil-testing instruments adopted at the June, 1921, meeting of the A. S. T. M. were exhibited for the first time and attracted great attention. The other particularly noteworthy point of interest was the automatic Time-Temperature-Humidity Controller, an important development in automatic control of humidity. It is the only controller which automatically controls a given temperature rise and humidity fall. This device regulates the valves on a heating coil and a spray so that the humidity is gradually decreased at the same time as the temperature is increased. Easy adjustments enable any desired temperature-humidity schedule to be duplicated. The remainder of the exhibit consisted of a representative display of Tag Thermometers, hydrometers and instruments and of Tag Controllers for temperature, pressure, time liquid-level, and condensation discharge.

TAYLOR INSTRUMENT CO.—A representative line of industrial indicating and recording thermometers and pressure gages, recording and indicating pyrometers, temperature and pressure regulators, laboratory thermometers and hyrometers.

TECHNICAL PRODUCTS CO.

TEXAS GULF SULPHUR CO., INC.—A special feature of the exhibit will be photographs of sulphur mining.

THWING INSTRUMENT CO.—A full line of temperature measuring and recording apparatus and a line of paper testing apparatus, including basis weight scales, humidometers and tearing testers.

W. S. TYLER CO.—A large exhibit showing their line of industrial indicating and recording thermometers and pressure gages, recording and indicating pyrometers, temperature and pressure regulators, laboratory thermometers and hydrometers.

UEHLING INSTRUMENT CO.—Uehling CO_2 recording equipment, draft recorders, vacuum recorders, draft analyzers, absolute pressure indicators, combined barometer and vacuum recorders and various other indicating and recording instruments.

UNION STEAM PUMP CO.—A complete line of pumping machinery for the chemical industry. Union simplex, duplex and triplex types of pumps for either steam or power drive. Centrifugal pumps, air and gas compressors, surface and jet condensers. A new improved rotary pump for viscous liquids.

UNION SULPHUR CO.

UNITED FILTERS CORPORATION.—Small models of an American continuous vacuum filter, Sweetland pressure filter, and United plate and frame filter press; also one complete disk and rotary valve from an 8 ft. diameter American continuous vacuum filter and the latest type of roller cake remover for automatically discharging the cake from this type of filter.

UNITED LEAD CO.—A complete line of United acid-resisting products will be shown: Chemical lead tube lined wrought steel pipe, flanged and screwed fittings, chemical lead-lined valves, special apparatus, hard lead and block tin-lined centrifugal acid pumps, block tin-lined pipe, fittings and valves, also chemical lead-lined and covered and block tin-lined and

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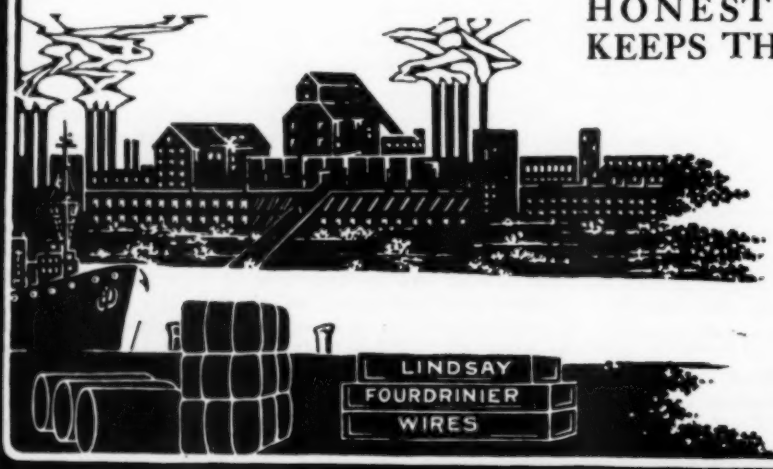

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covered special apparatus such as tanks, agitators, autoclaves and evaporators.

UNITED STATES CAST IRON PIPE & FOUNDRY CO.—Details of the manufacture of cast-iron pipe and large castings will be illustrated by an actual section of flange pipe and pictures showing the history of cast-iron pipe, and modern methods of production. Helander barometric condenser.

U. S. BUREAU OF STANDARDS.

U. S. STONEWARE CO.—Representative pieces of glazed acid-proof chemical stoneware, including various shapes and sizes of acid containers, pipe lines, mixers, manifolds, faucets, etc.

VALLEY IRON WORKS.—Laboratory autoclaves and sulphonators of various sizes.

WALLACE, JOSEPH H. & CO., INC.—The exhibit will consist of a stump from cut-over pine lands of the South, surrounded by samples of products which may be obtained from this waste wood. These products include turpentine, pine oil, rosin, tar, pitch, wood pulp, purified cellulose suitable for making gun cotton, kraft paper, fiber board and book paper. There will also be photographs and explanatory charts.

WALLACE & TIERNAN CO., INC.—A general line of chlorine control apparatus, including units for the production of bleaching solutions used in the paper, textile and kindred fields, for the sterilization of water, disinfection of sewage and tannery waste. Chlorine cylinder valves, Venturi type gas flow meters, pressure-reducing valves, etc., for the general chemical industry. Also dry feed equipment for heavy chemicals and the Palmer water spray apparatus for the examination of air.

WESTINGHOUSE ELECTRIC & MANUFACTURING CO.—Automatic regulator and control equipment for steel-refining furnaces. Motors for chemical industry, both a. c. and d. c., together with control equipment. Specially treated coils, George Cutter industrial lighting fixtures for indoor and yard lighting, together with other electrical equipment especially designed for the chemical industry.

WHEELER CONDENSER & ENGINEERING CO.—Evaporator, condenser, circulating pumps, Edwards air pumps, steam jet air pumps, cooling tower and a brass and copper tube exhibit.

C. H. WHEELER MANUFACTURING CO.—Exhibited the Radojet and Rotrex Vacuum Pump specialties. An actual cross section of the Radojet Air Pump occupied the center of booth. Its simplicity and unique lines and because of its wide usage as one of the best of the new type steam jet air pumps brought many engineers in for a closer examination. The engine-driven Rotrex pump used on the suction boxes of wires and felts in the paper industry, as well as general condensing plans, also was the subject of close examination.

WINSLOW & CO.—Exhibit consisted of their hand-molded acid-resisting brick, which they specialize in. Also featuring their Winslow, Inc., drainer tile.

WHITALL TATUM CO.—An exhibit of glassware and rubber ware from crude material to the finished product, with special emphasis on "Nonsol" chemical glassware.

WORTHINGTON PUMP & MACHINERY CORPORATION.

YALE & TOWNE MANUFACTURING CO.—Exhibited a model A-17 crane truck and a model C-6-36 trailer. These two units were seen at the early part of the exhibition moving material about the armory that was to be exhibited at the various booths.

Section of Cellulose Chemistry

The American Chemical Society held their sixty-second meeting in the gymnasium of the Columbia University, New York City, September 6 to 10, 1921.

On Wednesday and Thursday of that week the Section of Cellulose Chemistry held their meeting. It was the fourth consecutive meeting at which a special time and place has been set apart for the consideration of the chemistry of cellulose. The first two were symposia under the auspices of the Industrial Division and the other two regular meetings of the Cellulose Section. The interest at the present season was well sustained and the discussions free and valuable. There seemed to be general appreciation of the fact that in view of the very considerable amount of work on cellulose chemistry which is being done abroad we in this country will have to put special emphasis on this important field if our many cellulose industries are not to be left woefully behind in the race.

In an interesting paper Dr. Hibbert, chairman of the Section, outlined the results which have appeared since the last meeting bearing on the constitution of cellulose. Dr. Hawley of the Forest Products Laboratory told of some of the research of that institution which has considerably increased the yield of methanol in wood distillation. The paper by Dr. Tingle on the "Alleged Adsorption of Alumina from Solutions of Aluminum Sulfate by Cellulose" aroused much discussion, both among paper men and manufacturers of aluminum sulfate.

Professor Hibbert presented the report for the Committee on the Preparation of Standard Cellulose. At the recommendation of the committee it was voted that Dr. Johnsen be requested to present for publication a proposed method for the preparation of the standard sample of cellulose and that a copy be sent by the Secretary to each member of the Section with the request that criticisms be sent direct to Dr. Johnsen, care of Hammermill Paper Company, Erie, Pa.

The report of the Committee on Viscosity Standards was presented by Dr. Esselen, Chairman of the Committee. By means of a questionnaire sent to the manufacturers and users of cellulose ester solutions the Committee had found that the number of laboratories using the falling ball method for determining viscosities was in large majority. They therefore recommended that they be authorized to proceed to draw up a set of standard conditions for carrying out this method. A vote of the Section authorized that this be done.

The paper by Professor L. E. Wise on the Requirements of a Brief Critical Monograph on the Chemistry of Cellulose excited much discussion. It was finally voted that a copy of the paper be sent to Dr. John Johnsen and that he be advised that it was the opinion of the Section that a text-book on cellulose should be first prepared, to be followed later by monographs on specialized phases of the subject.

The Section voted to petition the proper authorities to form the Section into a regular Division.

The same officers were recommended for appointment for another term.

ABSTRACTS OF PAPERS

Acetolysis of Spruce Pulp—Preliminary Communication

By Walter Russell and Louis E. Wise

Acetolysis of spruce sulfite pulp, when carried out as in the case of acetolysis of cotton, yields appreciable amounts of cellobiose octacetate. The yield of cellobiose appears to depend on the normal (Alpha) cellulose content of the pulp, rather than on the so-called "total cellulose." The cellobiose reaction furnishes another link in the chain of evidence that the normal cellulose of spruce wood is chemically similar, if not identical with that of cotton.

The Constitution of Cellulose

By Harold Hibbert

The recent work of Karrer and of Freudenberg on octacetylcellobiose confirm the view advanced previously by the writer that the ratio of this product to dextrose pontacetate obtained from the decomposition of cellulose acetate is much higher than corresponds to the pentaglucosidylglucose formula for cellulose put forward by Hess. The results cast considerable doubt on the correctness of his formula, but on the other hand, are in no way in disagreement with that advocated by

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the writer. Further evidence in support of these is to be found in the recent paper of Denham on the methylation of cellulose.

The Action of HBr on Carbohydrates and Polysaccharides

By Harold Hibbert and Harold S. Hill

Cellobiose gives a yield of 27 per cent of bromomethylfurfuraldehyde while lactose gives less than 7.0. These two derivatives are structurally identical and there is thus the possibility of utilizing this reaction for the determination of configuration. The mechanism of the reaction is being carefully studied in view of its bearing on the constitution of cellulose.

The Role of Celluloses in Plant Life

By R. W. Thatcher

Included among the materials in plants which are grouped together under the general name "celluloses" are all of those compounds with which a plant builds up its skeleton or framework. They are generally fibrous in form, as distinguished from other types of materials in plants, such as the crystalline sugars, the granular starches, the gummy gluten, the curdy proteins, the oily fats, etc.

It is because of their fibrous nature that they have such enormous industrial importance in the manufacture of fabrics like cotton, linen, jute, etc., of ropes and strings; of celluloid, and of all kinds of manufactured wooden articles.

In plants, these fibrous materials serve to give stiffness to the stems of the plants. They are the woody material which constitutes the trunks of trees, the stiff straw of cereals. They are produced by the active plant protoplasm from the same sort of materials as otherwise yields starches and sugars, the important carbohydrate food materials of both plants and animals.

The plant cell has its self-regulating power to convert a varying proportion of carbohydrates into cell-wall, or cellulose substances. As the plant becomes older and its upper foliage or seed parts become heavier, more and more of the tissue material changes into cell-wall material, so that the stem and foliage becomes stiffer and better able to remain erect. Fruiting branches of shrubs and trees become enormously stronger and stiffer both by the thickening of their cell-wall material and by the depositing in it of various encrusting substances which convert elastic celluloses into hard, stiff, "woody fibre" or "wood." On that account, animals and human beings usually find plants much more palatable and nutritious in the early stages of their growth than after they have hardened off towards maturity.

Plant chemists recognize many different types of cellulose-like materials, which vary all the way from the gum-like substances which are found in nut shells, straw of cereals, etc., up to the hard wood of hickory, iron-wood and similar trees. The softer forms are usually found in those parts of the plant which have something to do with the development of the embryo of the young seedling for the next generation of plants and may help in some way to nourish the new seedling. The stiffer forms are found in the stems, or trunks of trees where they furnish the strength to withstand the strain of wind-storms, or of loads of fruit or nuts. It is these stiffer forms which are sought or cultivated for industrial uses in making fabrics, paper, rope, etc.

It is the task of the industrial chemist to sort out from nature's variety of cellulose materials those which have the proper qualities to make them useful for manufacturing purposes and to discover the proper technical processes for separating these skeleton materials from the encrusting of contaminating materials with which they are mixed in plant growth.

The Determination of the "Bromine Figure" or "Chlorine Factor" of Pulp and the Utilization of These Quantities in Bleaching

By Alfred Tingle

The extent to which bromine solutions, approximately decinormal, act on cellulose and on unbleached sulphite spruce pulp, has been investigated. Accurate measurements could only be made when the material was brought into solution before treatment with bromine. Under the experimental conditions used, it was found that bromine did not act on cellulose to any appreciable extent in an hour, but that it acted on unbleached sulphite pulp in stages, one of which was completed in 30 minutes. From measurements of this action a quantity was found, constant for each sample of pulp, which bears a definite and simple relation to the chlorine-consumption in bleaching the pulp.

The Alleged Absorption of Aluminum from Solutions of Aluminum Sulphate by Celluloses

By Alfred Tingle

Both neutral and basic solutions of aluminum sulphate were brought in contact under various conditions with cellulose in the form of (a) acid-washed filter paper (b) bleached sulphite spruce pulp. By the methods employed, no change in the aluminum content of the solutions could be detected, except when a pulp was used which contained calcium compounds and gave a strongly alkaline reaction to water, with which it was extracted. The deduction is made that absorption does not occur to any appreciable extent, and that the phenomena which have been accounted for by this cause, are due to other causes.

The Distillation of Methoxyl Groups in Wood Distillation Products

By L. F. Hawley and Subramanya Aiyar

It has been reported that the treatment of wood with sodium carbonate previous to distillation increases the yield of methyl alcohol. The source of this increase has now been determined. Maple wood containing 6.09 per cent methoxyl when distilled gave products with percentages of methoxyl as shown in column 1 of the table. On distilling the wood after treatment with 1 per cent sodium carbonate the methoxyl distribution is as shown in column 2 of the table and the increase of methyl alcohol is seen to come partly from the dissolved tar and partly from the charcoal. The proportion of total methoxyl in the original wood recovered in the distillation product remains about the same.

PERCENTAGE OF METHOXYL BASED ON THE WEIGHT OF THE WOOD DISTILLED

	Original Wood	Wood treated with $MaSCO_3$
Charcoal	0.285	0.044
Settled tar	0.517	0.588
Dissolved tar	0.303	0.173
Pyroligneous acid	1.617	1.953
Gas (Methane)	1.306	1.468
Total	4.028	4.226

Acetic Ether as a Solvent for Nitro-Cellulose and Cellulose Acetate

By H. F. Willkie

In discussing acetic ether as a solvent for nitro-cellulose and cellulose acetate, a review is made of the subject of cellulose esters solvents in general. Of these there are two general types. First, the solid solvents known as plastifying agents or latent solvent, which under the influence of heat or pressure form with the cellulose esters plastic masses which may be molded and worked into any desired shapes. Examples of these solvents are camphor, acetanilide and triphenyl phosphate.

Second, the direct or liquid solvents which dissolve the cellulose esters directly. These solvents are usually mixed with other liquids which may be solvents themselves or may

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Heavy Gearing and Friction Clutches for paper-mills, rubber-mills, tubemills, cement-mills, rolling-mills, stone quarries, and rock products, mining and coal-handling machinery, elevators and malt houses, turbines and water wheels, sugar refineries, packing houses, electric light plants, powder-mills, glass factories; cut gears and machine molded gears of all kinds.

Shafting, pulleys, hangers, couplings, collars, pillow blocks, worm-wheels, fly-wheels, and rope sheaves.

Makers of grey iron, and semisteel castings by analysis.

Special machinery built to order on modern tools at usual shop rates.

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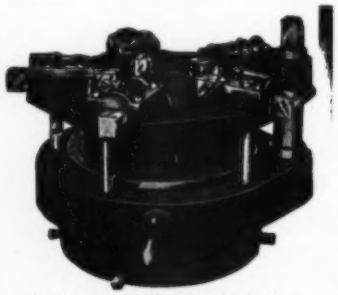
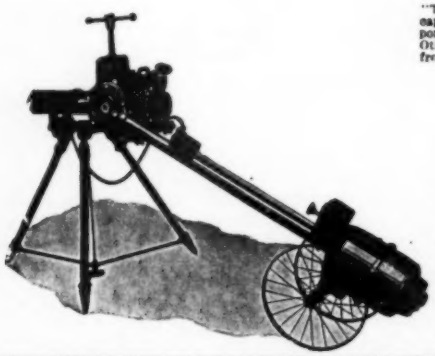
Fast, accurate pipe-fitting with "Toledo" Pipe Tools

THE "Toledo" line of Threaders, Cutters and Power Drives represents pipe-fitting equipment which cannot be equalled for accurate work, fast performance and general utility. They are ideal for quick emergency work and equally capable of handling the biggest, most complicated pipe fitting jobs. Send for catalog and Power Drive bulletin.

"Toledo" adjustable geared threader No. 2, capacity 2½ to 4-inch pipe inclusive. A light, portable device that threads fast and accurately. Other adjustable hand threading devices for pipe from ⅛ up to 12 inches.



"Toledo" geared adjustable threader No. 25, capacity 2½ to 6-inch pipe inclusive. The patented construction of this threader eliminates weaknesses generally found in devices where camplate principle is used for die adjustment to various sizes.



"Toledo" Power Drive for operating "Toledo" Geared Pipe Tools

Cut to left shows "Toledo" Drive operating "Toledo" Cutter No. 250. Capacity of cutter is 2½ to 6-inch pipe inclusive. Cuts clean and straight, leaving no burr. Power Drive is interchangeable and will drive ALL "Toledo" geared tools; it is simply constructed, portable and will operate any tool FIVE times faster than hand operation with ratchet handle or driving cross.

THE TOLEDO PIPE THREADING MACHINE CO. **TOLEDO, OHIO**

NEW YORK OFFICE: 50 CHURCH STREET, NEW YORK CITY

be nonsolvents. These are known as diluents and may impart some useful property to the mixture or may act merely as thinners. Examples of direct solvents are, amyl acetate, acetone and ethyl acetate. Among the more common nonsolvents are ethyl alcohol, fusel oil and benzol. These direct solvents and mixtures of them with diluents are used in the production of cellulose esters solutions which are used as lacquers and in the production of artificial leather and photographic films.

Water is a non-solvent. It is a precipitant of the cellulose esters. A solvent which is hydroscopic will take up moisture from the atmosphere even to the point of precipitation of dissolved cellulose ester.

A low boiling solvent by its rapid evaporation will cause precipitation of moisture from the atmosphere. If this absorbed moisture or precipitated moisture remains in the solution until the solvent has evaporated, a precipitation will occur, the water being a non-solvent. The quality of a cellulose ester solution will depend obviously upon the use of a solvent or solvent mixture which will evaporate in such a manner as to eliminate water. Non-hydroscopic high-boiling solvents such as amyl acetate have been considered essential to the accomplishment of this result.

The growth of the industries based upon the cellulose esters has depended upon the discovery and adaptation of solvents. Amyl acetate has been the most important direct solvent. It has a boiling point well above 100 deg. C.; it is but slightly soluble in water, is non-hydroscopic and stands high dilutions with non-solvents. It imparts to films smoothness, luster and strength. The supply of fusel oil from which amyl acetate is produced is decreasing rapidly, while the cellulose esters industries are increasing rapidly. The scarcity of amyl acetate has given rise to the need for a new and dependable solvent.

The production of high-grade anhydrous ethyl acetate of acetic ether as the pure product is designated and results obtained in experimenting with it as a solvent of cellulose esters point to the strong possibility of it taking the place of amyl acetate, and of it extending the field of cellulose esters solutions through its advantages over solvents used in the past. It can be procured in large quantities and the ultimate supply is unlimited.

Acetic ether is a colorless, limpid, pleasant-smelling liquid sp. gr., .90 B. P., 77 deg. C. Data is given to support the following claims: It is neutral in reaction and remains so on long exposure to air, light or moisture, and is non-hydroscopic. Acetic ether is a powerful solvent of nitro-cellulose and a good solvent for cellulose acetate. It works well in combination with the other well-known solvents and nonsolvents, and is a pure substance which evaporates without residue and at a uniform rate, giving rise thereby to homogeneous films. By a very important property it possesses of forming various constant boiling mixtures (especially one with water) more volatile than itself, it combines with the advantages of its low boiling point the ability to act as the high boiling solvents in overcoming the evil effects of water absorption.

Requirements of a Brief, Critical Monograph on the Chemistry of Cellulose

By Louis E. Wise

The article outlines the type of material and data that should be incorporated into a monograph on cellulose. Many of the older terms that still appear in the cellulose literature should be deleted or redefined. Proper weight should be given to carefully selected fundamental data and to the work of critical investigators. All hypotheses dealing with the constitution of cellulose or its derivatives should be subjected to close scrutiny, and those based on good experimental data should receive emphasis. Recent work on the colloidal properties of cellulose should be included. The monograph, besides being critical, should be suggestively written so as to stimulate research. A brief volume with a good bibliography appears to be more desirable than a series of monographs.

National Safety Council Holds Tenth Annual Congress

The Tenth Annual Safety Congress of the National Safety Council, held in Boston, September 26-30, was featured by the strong statements made by a number of the industrial executives on the program that they are continuing their accident prevention campaigns during the present industrial depression, because they have found that safety work is not a philanthropy but is a good business investment which lowers costs and increases production. At one of the general sessions the value of safety work in increasing production efficiency was discussed by several speakers, including Mr. L. P. Alford, vice-chairman of the Committee on Elimination of Waste in Industry, which was appointed by Herbert Hoover. Another of the general sessions included a round table discussion, during which officials of the International Harvester Company and other companies, both large and small, gave their reasons for the continuance of safety work during the present period.

At the meetings of the Paper and Pulp Section a number of interesting papers were given, as follows:

The Foreman's and Manager's Responsibilities in Paper Mills—Roy J. Murbach, The Gardner & Harvey Company, Middletown, Ohio.

Using a Camera to Promote Safety in Paper Mills—A. E. Frampton, Editor, "The Hammermill Bond," Hammermill Paper Company, Erie, Pa.

Beater Room Hazards—Charles Walker, Employment Manager, Eastern Manufacturing Company, Bangor, Me.

Direct Hits in Safety—Al. Kroes, Director of Safety Educational Work, Employers' Mutual Liability Insurance Co., Wausau, Wis.

Paper Mill Ventilation—H. S. Taylor, The Management Engineering and Development Company, Dayton, Ohio.

Handling Liquid Chlorine—D. K. Bartlett, Electro Bleaching Gas Co., New York City.

Social Phases of Safety Work—F. H. Rosebush, Department of Industrial Relations, Nekoosa-Edwards Paper Company, Port Edwards, Wis.

Mr. Al. Kroes' talk on "Direct Hits in Safety" was itself such a direct hit that it was repeated by request at one of the general sessions. The Paper and Pulp Section elected Walter A. Gleason, Safety Director, Hammermill Paper Company, as chairman; Adams Wilkinson, American Writing Paper Company, Holyoke, Mass., vice-chairman, and Miss Emilie Raub, Dill & Collins, Philadelphia, secretary.

Northwestern Div. of Supts. Hold Meeting

Fifty pulp and paper mill superintendents gathered in Wisconsin Rapids, Wis., on Friday, September 23, for the annual Northwestern Division convention of the American Pulp and Paper Superintendents' Association. This section includes Wisconsin and Minnesota, and the northern peninsula of Michigan. In addition to the superintendents, the convention was also attended by twenty paper mill supply men from all parts of the United States.

Wisconsin Rapids was selected for the convention in order to give the delegates an opportunity to see in operation the big paper machine which was installed in the local plant of the Consolidated Water Power and Paper Co. several months ago.

A banquet was held at the Hotel Witter. O. R. Roenius, chairman of the city council, gave the welcoming address, to which F. C. Boyce of the Wausau Paper Mill Co. replied. Mr. D. F. Wells of the Forest Products Laboratory at Madison was one of the principal speakers at the banquet.

The convention closed with another banquet at the Witter on

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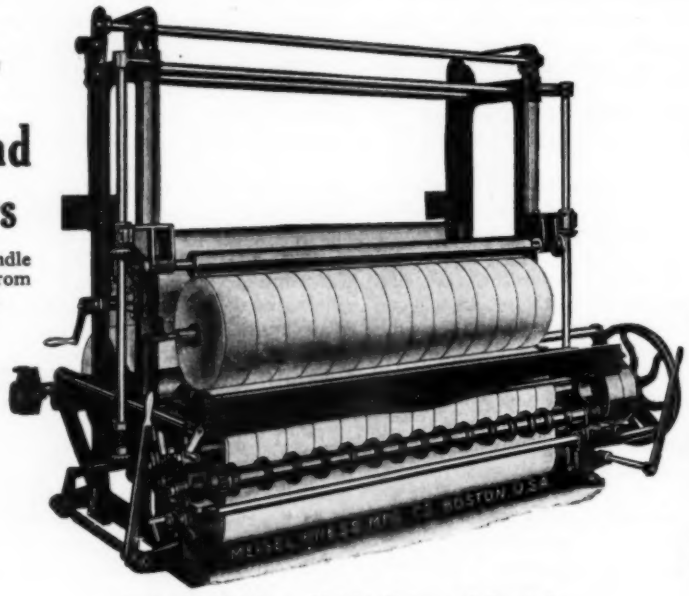
Any width, to handle any weight paper from tissue to cardboard.

Rolls up to 40 inches in diameter



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for tissue, waxed and other papers.

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Saturday evening. Dr. Otto Kress, chemist of the Consolidated plant, made the principal address.

Twenty Paper Bodies to Meet in Fall Conference

Twenty separate paper conventions will be held in Chicago the week beginning Oct. 31, when the two big federations of the industry, the National Paper Trade Association, composed of merchants, and the American Paper and Pulp Association, consisting of manufacturers, will hold a series of meetings, chiefly at the Drake Hotel.

It will be known as Fall Business Conference week by the manufacturers and Paper week by the distributors.

Trade Executives to Discuss Paper

In addition, paper will feature strongly in the convention of American Trade Association Executives at the Drake Hotel on Oct. 26 to 28. Emmett N. Naylor, secretary of four of the associations of manufacturers included within the American Paper and Pulp Association, is president of this association, and among those on the program are Secretary O. B. Towne of the Waxed Paper Manufacturers' Association and Dr. Hugh P. Baker, executive secretary of the American Paper and Pulp Association.

Fall Business Conference week will open Monday with the conference of the National Paper Trade Association. The manufacturers begin their meetings on Tuesday, Nov. 1. Of the twenty organizations comprising the American Paper and Pulp Association fourteen have already announced meeting dates, for Tuesday, Wednesday or Friday.

Unite for Noon Luncheon

Thursday will be devoted to the meeting of the American association, with speakers at the forenoon session representing the manufacturers, distributors and consumers of paper. A noon luncheon will be held jointly with the National Paper Trade Association, at which there will be speakers from the outside business world reviewing the relation of the paper industry to business in general.

Even the newsprint problem may be discussed at the forenoon meeting, though newsprint manufacturers have no group affiliated with the American Paper and Pulp Association, their organization including both Canadian and American mills.

The State Board of Education of Pennsylvania has provided instruction in paper making for world war veterans who petitioned for this. The classes are open to others of the State after payment of a $10 fee.

New England Cost Meeting

The first meeting of the 1921-1922 season of the Connecticut Valley Local Division of the Cost Association of the Paper Industry was held at the Hotel Nonotuck, Holyoke, Mass., on Monday evening, September 12th, 1921.

The meeting, which was preceded by a dinner at 6:15 P. M., was presided over by J. A. Reilly, President, who immediately turned to the first order of business, the election of officers.

Chas. H. Gardner, Chairman of the nominating committee, appointed at the previous meeting, submitted the committee's report recommending the following candidates, who were unanimously elected:

President—Ralph H. Morrill, Chemical Paper Mfg. Company; Vice-President—John N. Hazen, Taylor-Logan Co.; Secy.-Treas.—Joseph T. Daly, American Writing Paper Company.

The Committee also recommended that a committee of three be appointed to have charge of the program and arrangements for each meeting during the coming season.

Mr. Reilly spoke briefly, thanking the members of the association for their co-operation in conducting a very successful year and assuring the new president of his hearty support.

S. L. Bush was called upon and made a very ardent appeal for co-operation among the members and with the national

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Aniline *and* Pigment Colors

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The White Tar Aniline Corporation
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The history of American business development shows that its remarkable progress is due largely to the courage, foresight, boldness, and broadness of vision of our leaders.

Such qualities were never needed more than they are today.

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In order to do this we must have greatly increased manufacturing and trading facilities.

Let us not pay too much attention to prices but rather give heed to the great need.

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association. He outlined the work planned by the national executive committee, and spoke at length of the coming convention in Chicago, urging all members to attend. Mr. Bush urged all present to get into the work of the local association actively for the benefit of the individuals as well as the organization.

Following Mr. Bush, the President called upon S. E. Seaman of the Stamsocott Company, manufacturers of cotton linters, who spoke very interestingly on the methods of preparing this raw material for use in the paper industry, the advantages of manufacture to be obtained from its use, and particularly the advantages of cost. Following his talk the meeting entered into an open discussion of the subject and Mr. Seaman answered many questions put to him.

Association of Wood Using Industries Hold Annual Meeting

The Annual Meeting of the Association of Wood Using Industries, held in Chicago on September 26th, marked the close of the initial year of that organization's activities.

Reports by the officers and chairmen of the committees showed that the association is comprised of eighteen different units representing that many lines of industry fabricating forest products, representing in all over 6,000 individual manufacturers.

In commenting upon the work of the organization President Parsonage made the following statements:

"A year ago there was initiated the movement that had for its primary object the ambition to serve the crying needs of the wood using industries of the country.

"These men hoped to not only bring together the common problems of the various phases of the wood using industries, but also to act as a common center aiding and abetting a more clear and full understanding between the wood producer and the wood user.

"There was the thought in the minds of the initiators of this movement that in the final analysis the abuses and the wasteful methods of both the saw mill and the wood using factories were largely attributed to a lack of understanding between the two phases of the industry, and the proper education and closer personal contact would mean for the future not only a standardization of activities, but also mean much in the way of conserving the rapidly disappearing sources of wood supply.

"We have come through the past year, a period of readjustment that has been paralyzing in its effect and unheard of in the history of the world's business. Yet, with all handicaps we should feel proud that the storms have been weathered and that the Association of Wood Using Industries has justified its existence by starting various activities that I hope in the future will serve as a basis for not only a National Reforestation Policy, but also legislation and a plan of co-operation between the producer and the consumer of wood products that we can point to with pride in the years to come.

"Your executive board was largely instrumental in securing a substantial increase in the appropriation for the current year for the Forest Products Laboratory's activities. I feel that, as far as the wood using industries are concerned, this organization has justified its existence by this constructive effort alone.

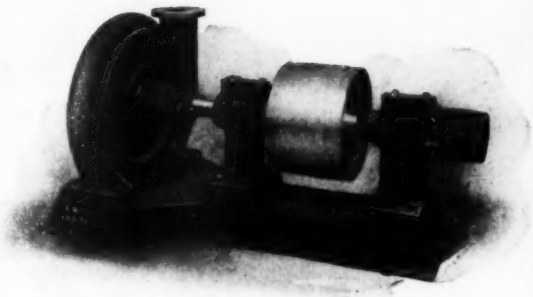
"I recommend that a wider and more thorough knowledge of the possibilities for service to individual industries by the Forest Products Laboratory be spread among the factory units in all the wood using industries. Helpful and constructive information can be obtained by any factory who wishes specific help in its problems.

"Your officials have spent considerable time during several trips to Washington in an effort to aid the passage of the so-called Snell Bill, which if made into law will form a logical basis for our future reforestation policy."

The Committee on Standardization and Research in its

CENTRIFUGAL PUMPS

for



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Manufactured By

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As shown in the folder we sent out to the mills—"*How to Dry Paper*"—showing our Compound Condensing System for draining the dryers and heating the air with the discharge from the dryers to condition the machine room should interest you. We guarantee a saving of 20 per cent in steam consumed for this purpose.

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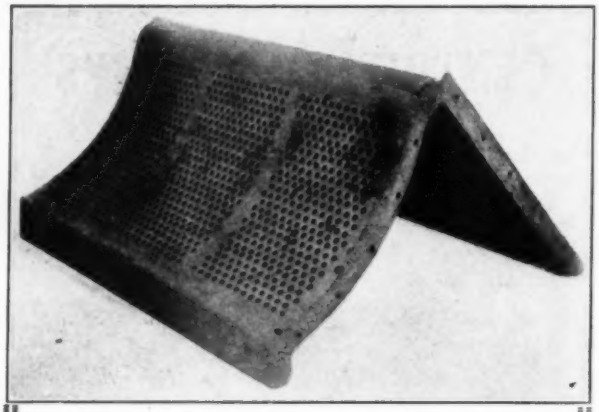

Because there are no moving parts this is a very simple but very efficient device. Patent No. 1,271,426 issued to Mr. Brownell Buehler, July 2nd, 1918.

The Shartle Continuous Beater Company
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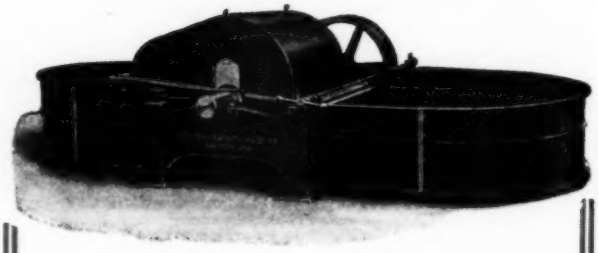

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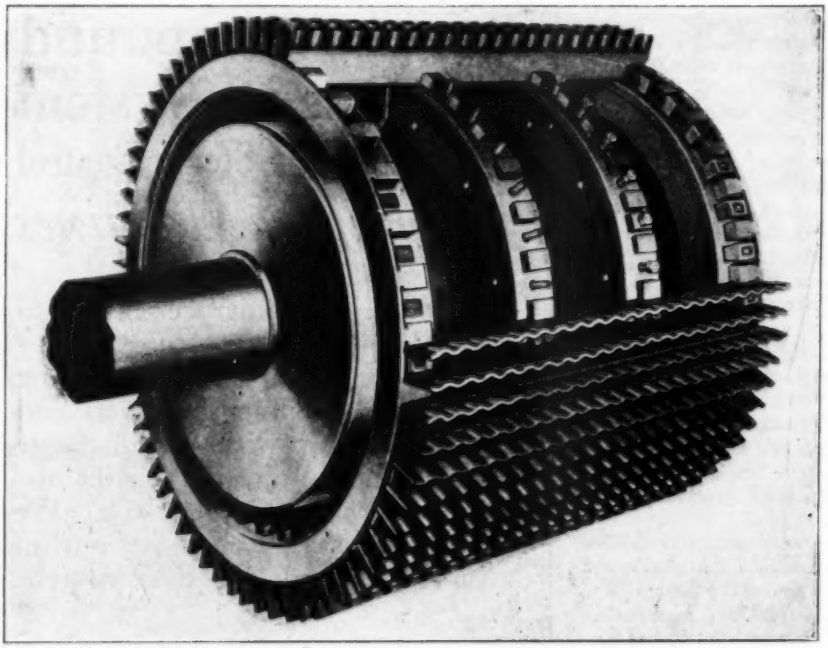

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1. Slotless bars which means no broken ears.
2. A bar designed for maximum strength.
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4. Bars require no shimming.
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6. Wedges drawn down by heavy wrought iron bolts with brass nuts.
7. Nuts locked by ribs on cover plates.
8. Damaged bars can be replaced without disturbing the others.
9. It is unnecessary to raise roll from bearings when refilling.
10. Roll can be refilled in one-fourth the average time.

DAYTON GLOBE BANDLESS BEATER ROLL

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DAYTON GLOBE IRON WORKS, **Dayton, Ohio**

report indicated that while business conditions have rendered it very difficult to canvass many of the industries and secure an adequate idea as to their normal requirements of wood stock, that considerable progress has been made and exhibits will be completed in the near future.

Due to the activities of the Association of Wood Using Industries a survey on dimension stock uses is being conducted by the Forest Products Laboratory and is making splendid headway. Out of the whole mass of data which is being accumulated a picture will ultimately emerge which will visualize, both to the producer and to the user of dimension stock, the advantages of a real study of conditions in that phase of wood stock.

The Nominating Committee submitted their report, which was adopted by the meeting, and the following officers were elected for the ensuing year: President, E. E. Parsonage; Vice President, Hugh P. Baker; Treasurer, F. A. Vogel; Secretary, Wm. B. Baker; Executive Committee, the officers and W. A. Babbitt, John Foley, W. Harry Davis.

Abandon Joint Meeting of T. A. P. P. I. and Superintendents

Definite action was taken by the executive committee of the Technical Association of the Pulp and Paper Industry at a meeting held Thursday, September 15, on the question of continuing with arrangements for holding the scheduled joint fall meeting of T. A. P. P. I. and the American Pulp and Paper Mill Superintendents' Association at Washington and other points during the week of October 18. Word had been received from representatives of the Superintendents' Association and the executives of the local committees of arrangements indicating a lack of enthusiasm for the meeting, as a consequence of the business depression. The executive committee of T. A. P. P. I. was in complete agreement with the officers of the Superintendents' Association in regard to business conditions being unfavorable for a joint meeting at the time scheduled, and on a vote being taken at the meeting it was unanimously resolved to cancel the fall meeting. It was, however, the unanimous opinion of all that a joint meeting with the members of the American Pulp and Paper Mill Superintendents' Association was desirable, and arrangements will be made for such a meeting at a place and time to be announced later.

The annual dues of active and associate members of T. A. P. P. I. will be reduced to $15. After voting unanimously in favor of this, the executive committee of the association instructed the secretary-treasurer to bill active and associate members for next year's dues at $15, instead of $25. This action was taken pending its ratification by the association at the next annual meeting, which, it is believed, will be unanimous, as there is a general feeling among the members of T. A. P. P. I. that the dues are now too high.

Change of Address for T. A. P. P. I.

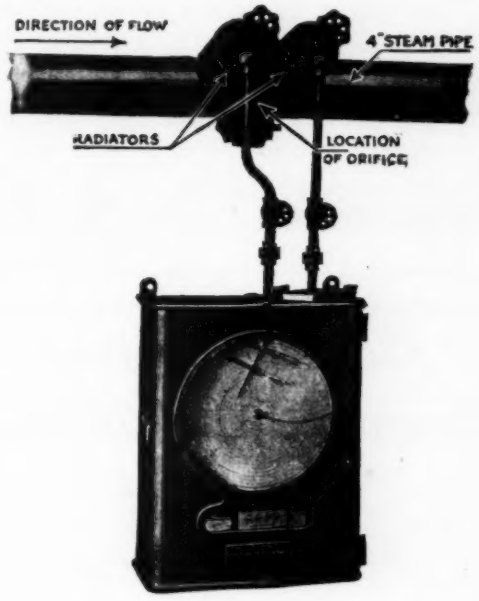
Changes are impending in the secretary's office of the Technical Association of the Pulp and Paper Industry. The office itself has been removed from 542 Fifth Avenue to the general offices of the American Paper and Pulp Association, 18 East Forty-first Street, New York, where quarters have been provided on the sixth floor by Executive Secretary Baker.

Recent elections of members and transfers of grades are reported as follows:

Junior members: Gosta P. Genberg, chemist, Nekoosa-Edwards Paper Company, Port Edwards, Wis., August 15, 1921; James G. Bullard, chemist, Crocker-McElwain Company, Holyoke, Mass., August 11, 1921.

C. W. Whitehouse, sulphite superintendent, Abitibi Power

Bailey Fluid Meter



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Bailey Fluid Meters are easily and cheaply installed as changes in piping are not required and the accuracy is guaranteed.

They are the most practical and satisfactory meters for recording and integrating the flow of steam to turbines, digesters, paper machines and other processes. Steam can be measured at any pressure and temperature, exhaust steam included.

Either pressure or temperature recorders, or both, may be added to record on the same chart as the rate of flow.

Our engineering department is ready to suggest the proper equipment for your service.

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FOR STUFF PUMPS

Absolutely balanced; will not pound out of shape

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Order these to replace worn-out balls.

We also manufacture—

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Every ball bears our registered trade-mark

Books on Paper Manufacture

Subscriptions are being taken for the new Textbooks on the Manufacture of Pulp and Paper of the Joint Committee on Vocational Education of the Pulp and Paper Industry, a complete set of which should be owned by every firm or individual connected with the industry.

The set will be complete in five volumes. Volumes I and II deal with arithmetical operations, elementary mathematics, drawings, etc. Volumes III, IV and V, to be issued shortly, will deal with pulpwoods and their preparation; manufacture of pulp; analytical methods; and paper manufacture in all its aspects.

Volumes I and II are now on sale at $5.00 a volume. In the selection of classroom problems bearing on the principles and practice of pulp and paper manufacture they represent the highest standard in textbook publishing.

Orders, with remittances, will be filled by the Technical Association of the Pulp and Paper Industry, 18 East Forty-first Street, New York.

WYCKOFF WOOD PIPE

PRESSURE PIPE THAT NEVER BURSTS.
Built in sizes 1 inch to 48 inches.

The Paper Industry is successfully using thousands of feet of this Pipe and they find it to be the best conveyance for Paper Stock and Acids that can be obtained.

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DURABLE—ECONOMICAL—EASY TO INSTALL

Built of selected Canadian White Pine, Wyckoff Wood Pipe is wound with steel bands whose tensile strength is 58,000 to 65,000 lbs. per square inch. The experienced engineer selects a pipe of proven dependability. Wyckoff Wood Pipe, during the past 65 years, has built a reputation that stands the keenest competition. It has been, during this time, the choice of the largest pipe users in the world. We also manufacture a high grade underground steam pipe casing.

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& Paper Company, Iroquois Falls, Ont., has, upon his application, been transferred by the executive committee from the grade of associate member to that of active member, dating from August 1.

Thomas J. Keenan announced his resignation as Secretary-Treasurer of the Association in order to accept the position of editor of Paper, in the reorganization of which he becomes an officer and stockholder. As a few weeks may elapse before a successor to him as secretary and treasurer of the Association can be chosen, Mr. Keenan will carry on the work of the Association in the interval.

Boxing and Crating Training Course

The industries of the country have responded to the practical course of instruction in Boxing and Crating at the Forest Products Laboratory, Madison, Wis., to such an extent that at the end of the tenth course, July, 1921, 24 different industries in 46 cities had been represented; twelve firms had been represented by two or more men; two firms had sent men to three courses, and one firm had sent men to four courses.

On account of this response, it has been deemed advisable to announce dates for three courses in addition to the November course previously announced. The dates for the courses are as follows: November 7-12, 1921; January 9-14, 1922; March 6-11, 1922; May 1-6, 1922.

This course is essentially a practical demonstration of such points as the characteristics of different styles of boxes and crates, the importance of nailing, the advantages of using dense woods, the efficiency of metal straps, the effect of moisture and change of moisture conditions in lumber on the strength of boxes and crates, tests on wire bound boxes, methods of improving the design of fibre board boxes, and many other points of interest to the box and allied industries. The making of drum tests, drop tests, compression tests and various other kinds of tests can drive home the fundamental principles of container construction as can no amount of published reports.

Pioneer Paper Maker Dead in Glens Falls

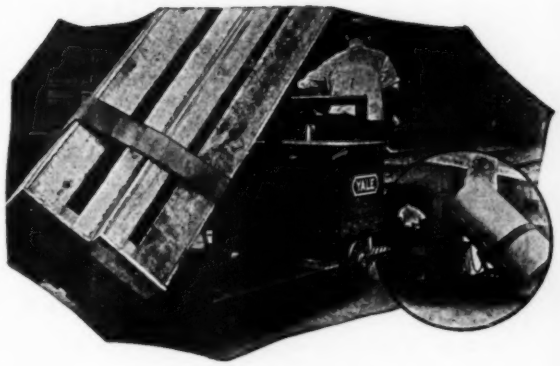
Thomas S. Coolidge of Glens Falls, pioneer paper manufacturer, and a former official of the International Paper Company, died on Saturday, September 24, at his home in Glens Falls after being confined to the house for several days with heart disease. Mr. Coolidge was 83 years of age.

In 1881 Mr. Coolidge started the manufacture of ground wood pulp, organizing the Glens Falls Pulp Company with his brother, the late Jonathan T. Coolidge, George W. Lee and the late W. W. D. Jeffers. Five years later they consolidated the Glens Falls Pulp Company and the Lake George Pulp and Paper Company. The name of the latter firm was retained. W. I. Higgins of Glens Falls, formerly of Ticonderoga, and John Lambert were associated with the Glens Falls men in carrying on the new pulp and paper company at Ticonderoga. Mr. Coolidge was vice president.

The Lake George Pulp and Paper Company was included in the merger of paper mills which eventuated in the International Paper Company. Mr. Coolidge went to New York and became transportation manager of the International. After three years he returned to Glens Falls and retired.

Mr. Coolidge was the oldest director of the Glens Falls Insurance Company with respect to length of service and he was also a director of the Glens Falls National Bank. His widow and one daughter, Mrs. Arthur W. Sherman of Glens Falls survive him.

Book paper leads the industry in value of output, with a product worth $220,000,000 in 1920, and board and wrapping had a close race for second place.



For every industry there's a Yale Way

HERE'S the Yale "Tilting Cradle" Truck, designed especially for handling heavy rolls of paper, long wooden crates, iron and steel pipe, rolls of roofing material, and other unwieldy objects wherever doorways or passages of low headroom have to be negotiated.

Old-fashioned methods are wasteful. The Yale Way is the modern way.

Yale Way handling equipment includes Electric Industrial Trucks, Tractors, and Trailers; Spur-Geared, Screw-Geared, and Differential Chain Blocks; Electric Hoists and Trolley Systems. Send for full details. Our engineers will gladly help you.

YALE

Yale Made is Yale Marked

The Yale & Towne Mfg. Co.

Makers of Yale Products: Locks, Hoists and Electric Industrial Trucks

Stamford, Conn., U.S.A.

YALE Hoisting and Conveying Systems

L. A. DeGUERE

Industrial Engineer.

Wisconsin Rapids, Wisconsin

Paper, Chemical and Ground Wood Mills, Hydro Electric and Steam Power Plants, Surveys, Estimates, Appraisals and Reports.

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208 N. Laramie Ave., Chicago, Ill.

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Engineering Service for Paper Mills

Construction and Production

BOOK, BOXBOARD, BONDS AND LEDGERS, TISSUE, ROPE MANILAS AND SPECIALTIES

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MANAGEMENT ENGINEERING AND DEVELOPMENT CO.

7TH FLOOR CITY NATIONAL BANK BLDG.,

DAYTON, OHIO.

DESIGN, CONSTRUCTION AND OPERATION

OF

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WATERPOWER DEVELOPMENT

STEAM POWER PLANTS.

PLANS AND SPECIFICATIONS

EVALUATIONS AND REPORTS

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WATERTOWN, - NEW YORK

Special Sulphite Mill Equipping

Agents for the Heiskanen Pulp Bleaching Apparatus.

Fitchburg Duck Mills

ESTABLISHED 1844

FITCHBURG, MASS.

MANUFACTURERS OF

STANDARD AND MULTIPLE

DRYER FELTS

English Weave in Two, Three, Four, Five and Six Ply—60 Inches to 176 Inches in Width

Fine Faced Felts for Fine Papers. Absolutely no felt marks in paper. TRIBUNE Three Ply Felts for Coarse Papers.

Do You Know That

Claflin Continuous Beaters

Have 3½ times the efficiency of other beaters in use today for Beating, Brushing and Refining Paper Stock?

For Increased Production, Greater Economy, Stronger, Finer, More Uniform Pulp, the CLAFLIN CONTINUOUS BEATERS will more than satisfy.

Ask Us for Our New Catalogue

THE CLAFLIN ENGINEERING COMPANY

LANCASTER, OHIO

The Canadian Fairbanks-Morse Company, Limited Agents for Dominion of Canada.

What It Costs to Plant Artificial Forests

The first survey of the actual cost of commercial planting of forests now being made by the Woodlands Section of the American Paper and Pulp Association is showing some surprising results, indicating that the costs are much lower than has customarily been estimated. The paper mills of the country are beginning on an extensive scale to grow from the seed up their trees from which their future paper will be made, and the chief handicap to success is now found in taxation methods which prove a constant drain on the owner during the period of growing the crop.

The cost figures have been classified by districts. The New York cost is figured at less than $15 an acre in most cases. One extensive plantation cost $13 per acre, including cost of stock. Another figured the cost of seedlings at $4 per thousand, while still another found that by planting tree seeds in an ordinary truck garden as an auxiliary crop, it cost only $40 to $50 to produce 200,000 transplants. The success of the New York state plantations ranged from 90 to 99 per cent of survivals.

One big Canadian company found its cost, planting much closer than is the custom in the United States, to be $15.12 an acre. Ohio, planting cottonwoods, fixed the cost at $13.93 per acre.

New Jersey plantings, with a wide variance in species and locations, found a cost varying from $5 to $15 per acre. Vermont's costs ran to no higher than $12, with an average of $9 per acre, and the New England success in general ran high, ranging from 80 to 95 percent of survivals.

This low cost figure for establishing new forests indicates that there will be a wide expansion of reforestation activity by paper mills in the east which must grow trees for their future supply, or depend on imported raw material.

Alaska Paper Mills Handicapped by Freight Rates

"Special freight rate concessions are necessary if Alaskan producers of paper and pulp are to be enabled to live up to the enthusiastic promises for future Pacific Coast development," says the American Paper and Pulp Association in a bulletin to members of the association. The United States Forest Service has been urging the development of the vast resources of the Alaskan forests by the paper industry, and several new mills are projected in the Tongass forest district alone. The freight situation, however, seems to promise difficulties, for the association says:

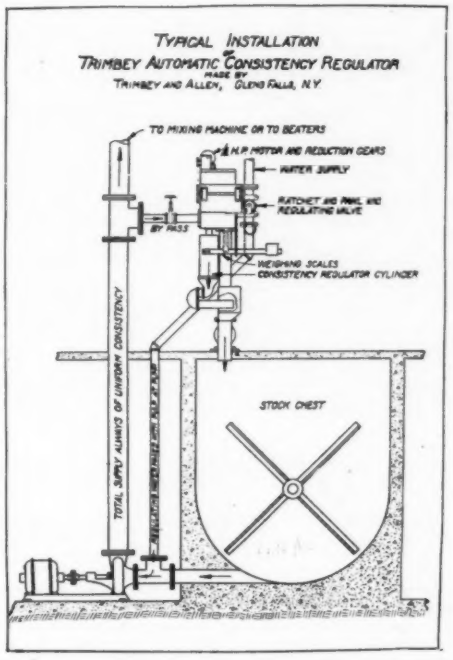
"The Alaskan mills must face the freight rate situation in competition with Scandinavia. The summer route from Helsingfors to New York through the Kiel Canal is 4,220 miles, the winter route via Copenhagen about the same, and the summer route via Copenhagen is 4,087 miles, while the New York-Stockholm route is 3,963 miles.

"On the other hand, the distance from Seattle to New York, all water via the Panama Canal, is 6,056 miles, and the distance from Seattle to Juneau is an additional 856 miles.

"Additional handicap to the development of Alaska for paper production is found in the fact that the Juneau-New York service would come under the coastal navigation laws, requiring shipment in American ships at the higher cost of operation of such lines as compared with foreign-operated ships. The Scandinavian shipments have in addition to this advantage of half of the distance lower wages on ships, the advantage of cheaper labor in the manufacture of the pulp and paper itself, and the further advantage of a depreciated exchange.

"These advantages of shipping, labor and exchange conditions to the Scandinavian producers are in addition to the even greater factor of the Scandinavian maintenance of well-managed forests, giving regular and permanent returns in pulpwood."

Why Guess at Consistencies?



Install a Trimbey Automatic Consistency Regulator and know them. Know that it is always the same.

It will hold stock at a maximum variation of less than 0.2% consistency as pumped to mixers or beaters.

It removes the main cause of uneven weights.

The Paper Mill Superintendent of Laurentide Company, Ltd., writes:

"There is no question but what the control of the consistency of the Groundwood and Sulphite is responsible in a large measure for our successful running at high speed."

—and the Trimbey is doing it.

Our Line Includes:

Trimbey Automatic Consistency Regulators.
Allen & Trimbey Automatic Continuous Mixing and Proportioning Machine.
Trimbey Thickener for Chemical Pulp.
Wells Improved Rotary Sulphur Burner.
Allen Constant Level Stuff Boxes.
Trimbey & Tibbitts Soft Stock Motor.

Trimbey & Allen
Glens Falls, New York

Have you a Good Solid Leakproof Roof to withstand the ravages of the coming winter? Is your Merchandise and Machinery Safely Protected?

Saveall Liquid Asbestos Roofing

Forms a complete, new, indestructible unit roof right over your old surfaces. No need to tear off your old roof. Any inexperienced person can do the job.

GUARANTEED WATERPROOF AND WEATHERPROOF FOR 10 YEARS

OFFERED ON FOUR MONTHS' APPROVAL

"Saveall Your Roofs"

WRITE FOR SPECIAL LOW FACTORY PRICES

THE FRANKLIN PAINT COMPANY

Main Works and Offices, CLEVELAND, OHIO

PUMPS

This ancient Japanese Waterwheel depended entirely upon human foot power.

THE Waterwheel (here pictured) was used in irrigating Japanese rice fields. All day long the coolies treaded the paddles, setting up a current which forced the water into the fields. It is said that these patient coolies often worked themselves into a sort of "trance."

You can depend upon American-Marsh Pumps for faithful, untiring service. They possess the most modern improvements, and are built to solve difficult paper mill pumping problems.

Write for American-Marsh Bulletins

American Steam Pump Co.

BATTLE CREEK, MICH.

Chicago Office:
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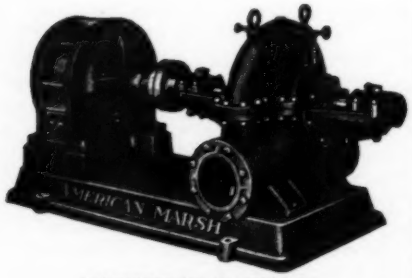
The American-Marsh line also includes Boiler Feed Pumps, Power Pumps, Air Compressors, Vacuum Pumps, Condensers, Deep Well Engines, Stock Pumps.



CENTRIFUGAL PUMP

To Stop Forest Fires in New York State

Four new fire prevention districts will be established in New York State at once, as the result of the co-operation of the United States Forest Service with the New York State Conservation Commission, according to advices from Washington. The four new districts which, with the areas already protected, will give protection to 90 percent of the forested regions of the state, will be as follows:

Columbia and Rensselaer Counties, embracing the foothills of the Berkshires, the Grafton section and the foothills of the Green Mountains.

Lower Hudson River in the Palisades, to include all forest land east and west of the river.

The Ramapo Mountain section.

The Allegheny mountain section, covering forested areas in Allegany and Cattaraugus Counties.

Last year the Federal government appropriated $6,000 to New York State. The coming year, however, as a result of a campaign for better care of the forests in which such organizations as the American Forestry Association, the American Paper and Pulp Association, the National Lumber Manufacturers Association, and other similar organizations participated through the National Forestry Program Committee, the Weeks law was amended to largely increase the funds available for work in the several states. Last year the State of New York expended $137,000 in fire prevention, and the federal government $6,000. The new appropriation allots the state $22,050, these funds going to the states in proportion to their own activity in fire prevention.

In addition to providing new fire prevention districts, the federal service will provide the state with four forest fire engines, operated by gasoline, of the type which has already proved successful in use by the State Conservation Commission.

$1,000,000 Pulp and Paper Plant to Begin Operations Soon

The new million dollar plant of the Bastrop Pulp and Paper Company, at Bastrop, La., is nearing completion and will be in operation within the next six weeks. The last of the machinery is now being installed.

Wood will be secured from 200,000 acres of second growth leaf or "loblolly" pine, averaging twenty cords to the acre, after leaving a sufficient number of standing trees to insure reforestation. This timber supply is within a radius of twenty-five miles of Bastrop. This character of pine has a very rapid growth and renews itself in trees to the diameter of eight inches every ten years, which insures the mill a perpetual supply of raw material.

Natural gas will be used for fuel at a price equal to coal at 25 cents a ton delivered. The plant will employ 350 men.

Three artesian wells with a capacity of 1,000 gallons a minute each have been drilled, guaranteeing a plentiful supply of clear water. The mill will be connected with two railroads, the Missouri Pacific and the Arkansas and Louisiana Midland, the pulp company having constructed 10,000 feet of switch tracks. The power equipment consists of 3,000 horsepower Edgemore water tube boilers and 2,000 electric horsepower.

The mill is assembling its first timber supply and will be ready to begin operations by October 1.

E. H. Frank Talks to Albany Typothetae

Edward H. Frank, of the American Writing Paper Company of Holyoke, Mass., recently addressed members of The Capitol District Typothetae at a luncheon in the Albany Club on the need of standardized manufacture and production of paper.

Standardization of paper manufacture is desired by the

BROWNHOIST

Increased handling capacity at one-half the cost

To double your handling capacity and at the same time cut the unit cost in half is certainly worth while. The Brownhoist locomotive crane shown above is doing this at the paper mills where it is working. This crane handles 85 thousand feet of timber per day at a cost of 70 cents per thousand. This is against 45 thousand feet at a cost of $1.48 per thousand under the former method.

In addition to the speed and low cost of upkeep of Brownhoist cranes their great flexibility should be considered. Practically all kinds of materials can be handled anywhere as Brownhoists are made to operate on traction wheels or creeper trucks as well as railroad trucks. And the saving of handling materials by locomotive crane is usually as great or greater than the above.

Catalog K shows many types of Brownhoist cranes working in different industries. If you have any handling problems you will be interested in seeing how some Brownhoist owners are solving theirs. Write us. The knowledge of 40 years of crane building is at your service.

The
Brown Hoisting Machinery Co.
CLEVELAND, OHIO, U. S. A.
Engineers and Manufacturers of Heavy Dock Machinery, Bridge Cranes, etc., as well as smaller Cranes and Hoists
Branch Offices in New York, Pittsburgh, Chicago, San Francisco and New Orleans

KNOW WHAT YOUR COAL BILL SHOULD BE

There's no longer any such commodity as "Cheap Coal," and indications are that there probably never will be again. At present prices, or for that matter—at *any price*—it is neither good engineering practice nor good management to check your coal by mine weights or railroad weights.

RELIANCE WEIGHING MACHINES

insure an *accurate* and *positive* check on every ounce of coal consumed. They provide a means, without additional labor cost, of checking the total received against the total purchased. They show to operator and executive the exact amount of coal consumed by each boiler. They bring efficiency and economy into coal consumption.

Weighs—records—indicates—without manual effort—the entire operation automatic.

Each machine is a unit in itself, so perfect in design and flexible in application that it will meet any existing plant conditions.

The services of our engineers are at your command in helping you plan prospective installations.

Write us for details.

RELIANCE WEIGHING MACHINE CO.

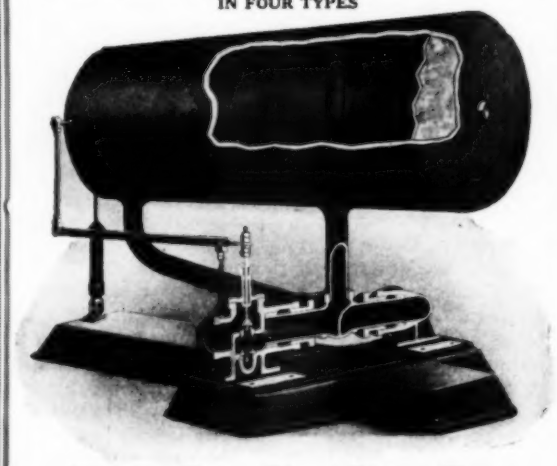
General Offices and Factory.

LUDINGTON, MICHIGAN

Representatives in principal cities United States and Canada

The ELLIS AUTOMATIC TILTING STEAM TRAP

IN FOUR TYPES



Vacuum Traps, Direct Return Traps
Lifting Traps, Separating Traps

ESPECIALLY ADAPTED FOR PAPER MILL USES

The best trap made to remove the steam condensation from paper machine dryers. Works on a new and improved principle different from any other trap on the market.

Let us send you further information

THE ELLIS DRIER COMPANY

332 South LaSalle Street Chicago, Ill.

Smith Hydraulic Turbines

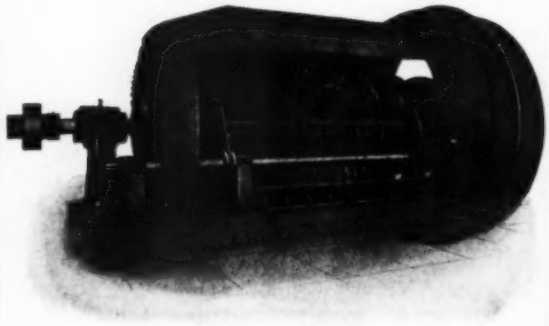


Illustration shows horizontal unit developing 2,400 horsepower under 42 feet head, at

88% EFFICIENCY

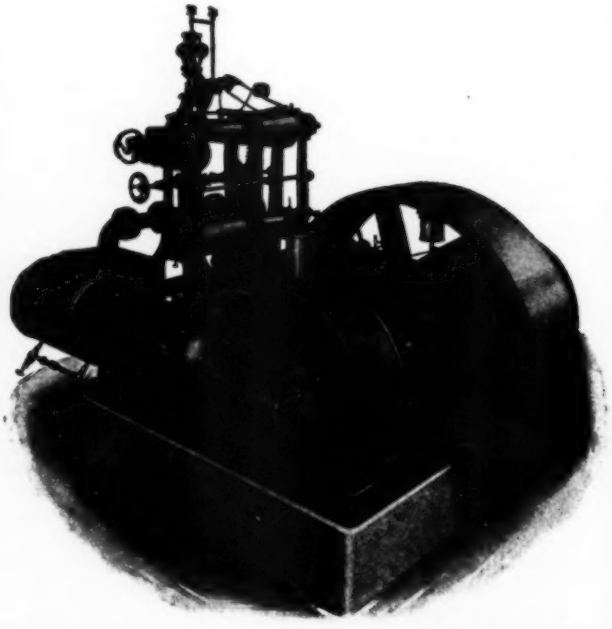
installed at Glens Falls, N. Y., Mill of International Paper Co.

Write Dept. "S" for Illustrated Bulletin

S. MORGAN SMITH CO., York, Pa.

Branch Offices:

BOSTON	CHICAGO	MONTREAL
176 Federal St.	76 W. Monroe St.	405 Power Bldg.



Variable Speed Engine

The engine illustrated above is especially designed to drive paper machines, giving continuous and reliable service. A patented safety device protects your employees and plant.

THE BROWNELL CO., Dayton, Ohio

SEND FOR BULLETIN E-4

United States Department of Commerce, and in a communication to Herbert Hoover, secretary of commerce, C. E. Enyon, president of the United Typothetae of America, advised that the department follow the plans of the Holyoke company in its standardization policy. Mr. Frank said, where the company was manufacturing 168 brands of paper it has so standardized the production that it is now turning out only thirty-five brands. Through this method, Mr. Frank said, the manufacturer, merchant and printer are saved a large expense.

Will Make Paper in Denver, Colo.

The main central building of the old Platte River Paper Mill Company has been purchased by W. H. Carter, D. H. Greene and F. M. Gill and within ninety days they will begin the manufacture of paper, it is reported.

The first product of the company, to be known as the Colorado Paper Products Company, will be tissue napkins and wrapping paper, but eventually the company plans to branch out in the manufacture of flat newsprint.

To Produce More Paper

International Paper Co., which was practically idle not a great while ago due to a strike of its employes, is now producing about 500 tons of paper daily. One-half of this is news print, and the company is expected soon to increase production to about 700 tons daily. This will almost meet all its requirements so that it will be unnecessary to buy paper to meet contracts.

Plans for the development of 85,000 horsepower at Kootenai, Mont., on the Kootenai River, were made public with the filing of an application with the Federal Trade Commission by the Kootenai Power Construction Company of New York City. It is proposed to build a dam and power house to furnish power for a pulp mill at the confluence of the Kootenai and Yak Rivers.

Paper Mill May Be Built in Flathead Forest, Expert Says

Prospects for a paper mill are excellent in the Flathead forest, Missoula, Mont., according to U. S. Swartz of the forestry service.

There is in that district between 400,000,000 and 500,000,000 feet of spruce, white fir, balsam and logen pole timber that would make good pulp, Mr. Swartz declares.

Just ten months from the day it closed its doors to workmen, the Union Bag and Paper Corporation has again resumed operations with practically a full force of workmen in the pulp and paper departments at Kaukauna, Wis. All the old hands laid off in the winter were taken back and a few new workmen hired. All machines are now in operation and it is expected the mill will continue to run until it is once more working at full capacity.

The uncertainty of the water supply will be the only problem with which the corporation will have to contend.

A revival of interest in paper is clearly shown by reports from Swedish mills that "one machine after another is being put in motion again." The improvement is likely to continue. "Especially for news print the demand is lively, and it appears that the paper mills running this grade have orders on hand three and four months ahead."

Canadian pulp and paper exports for August, according to Canadian Pulp & Paper Association, totaled $9,395,391, a decline of $8,863,336 as compared with August, 1920, but an increase of $2,628,835 over July, 1921. They were the highest for any month of the fiscal year.

DIAMOND
VALV-IN-HEAD
SOOT BLOWERS

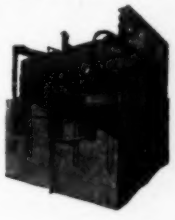
At every point the Diamond Valv-in-Head soot blower effects important savings. For example:

Its use assures 100% cleaning efficiency, thus putting many additional dollars a year, as the result of decreased fuel consumption and better boiler efficiency, in the owner's pocket.

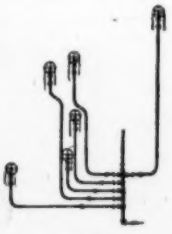
With this system the cost of operation and maintenance is from one-third to one-half that of independent valve systems, making it very profitable to replace the ordinary revolving soot blower heads with the new Valv-in-Head.

Consider the matter of pipe, valves and fittings on new installations. A saving is effected of practically two-thirds in the actual length of pipe required. The elimination of expensive individual control valves in favor of the Valv-in-Head is an important cost consideration. This decreases the initial cost of these items by one-half to two-thirds and reduces radiation losses from the soot blower lines proportionately.

On a typical six-unit installation, with the independent valve system, 83 feet of pipe and six 2-in. individual control valves are required. With the Valv-in-Head only 25 feet of 2-in. pipe and no individual valves are required. With this six-unit installation the saving in cost of pipe, valves and fittings effected by the Valv-in-Head system is approximately 64 per cent. The comparisons are:



Valv-in-Head system —25 feet of pipe, no independent valves.



Independent valve system—83 feet of pipe, six 2-in. valves.

Using "Bronze body valves, nickel seats and discs":

Independent valve system	$249.44
Valv-in-Head system	90.83
Saving by latter	$158.61

Every boiler needs a mechanical soot blower and you will save money by buying the best. Diamond Valv-in-Head blowers are adapted to all types of water tube boilers. On request our Service Engineer will go over your existing soot blower installation and advise whether it can profitably be replaced with the Diamond Valv-in-Head system.

Ask for your copy of Bulletin 297 describing the new blower

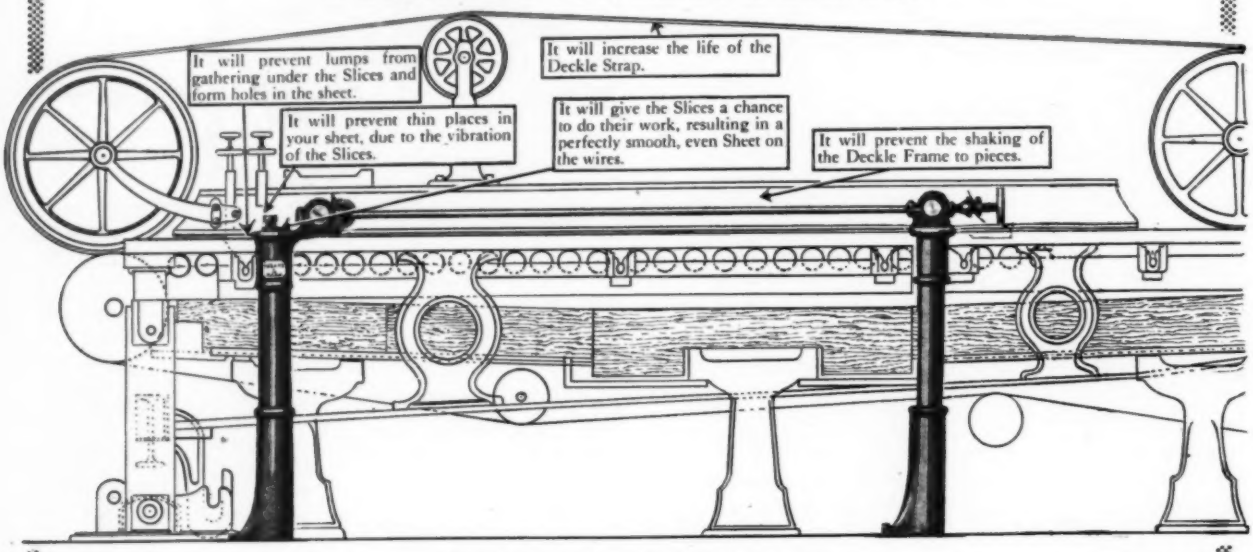
DIAMOND POWER SPECIALTY COMPANY
Detroit, Michigan

Diamond

SOOT BLOWERS - SAVE 4 to 8% FUEL

The Acme Deckle Frame Support

"is indispensable to the making of Good paper"


It will prevent lumps from gathering under the Slices and form holes in the sheet.
It will increase the life of the Deckle Strap.
It will prevent thin places in your sheet, due to the vibration of the Slices.
It will give the Slices a chance to do their work, resulting in a perfectly smooth, even Sheet on the wires.
It will prevent the shaking of the Deckle Frame to pieces.

It will make better edge, save breaks and take less power.

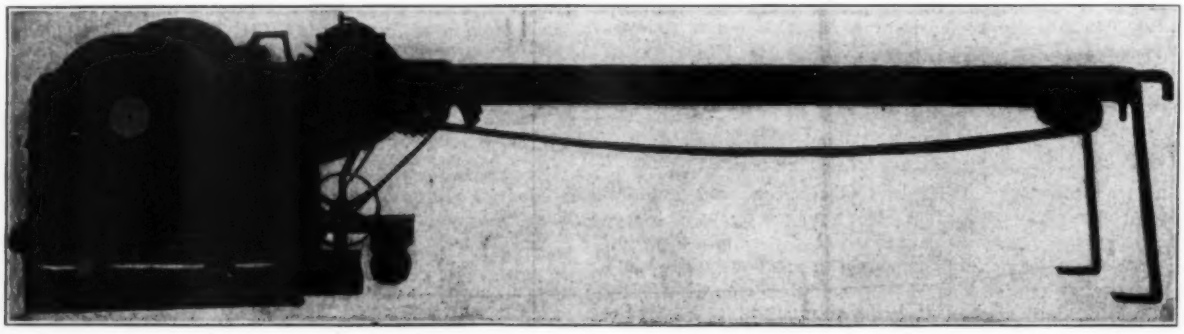
Manufactured and Distributed by

HUBAND & NASH

Menasha, Wis.

Most of the best mills in this country are equipped with this device.

No. 11 "GIANT" PAPER STOCK CUTTER



Capacity 2½ Tons Per Hour

Especially Adapted for Handling Waste Paper, Magazines, Etc., Before Feeding to the Beaters

Whatever You Cut, A GIANT Will Solve Your Problem

LET US FIGURE IT OUT FOR YOU

TAYLOR, STILES & COMPANY, Riegelsville, N. J., U.S.A.

WATEROUS ENGINE WORKS
Brantford, Ont., Canada
Canadian Representatives

R. J. MARX
133 Finsbury Pavement, London E. C.
Sole Agents for Europe

Re-organization Effected

In anticipation of improved business conditions the Galland-Henning Mfg. Co. of Milwaukee, Wis., has recently reorganized and increased its sales engineering department.

Messrs, N. W. LeVally and H. C. Norman, of Milwaukee; P. H. Arden, of Chicago; S. W. West, of Cleveland, and John F. Willard, of Los Angeles, formerly connected with Logemann Brothers Company, are now affiliated with the Galland-Henning Mfg. Co.

N. W. LeVally as general and sales manager and H. C. Norman as assistant sales manager will be located in the general offices in Milwaukee. P. H. Arden will be located in Chicago; S. W. West in Cleveland, and John F. Willard in Los Angeles as sales engineers in their respective districts. R. O'Donnell will be located in New York as sales engineer for the New York district.

With this reorganization the Galland-Henning Mfg. Co. will improve and extend its line, covering electric and hydraulic baling presses for metals, rags, paper and other waste products, accumulators, pumps, valves and hydraulic production presses.

Fritz R. Lindh Joins Chicago Belting Co.

Fritz R. Lindh, formerly chief engineer of the Graton & Knight Mfg. Company, has joined the sales organization of the Chicago Belting Company, Chicago.

After leaving the army, Mr. Lindh joined the organization of Graton & Knight, in July of last year, succeeding Dr. Wison as head of their Graton & Knight engineering department, where he was in charge of all field research and testing at the factory as well as of all field engineering service. For the last six months most of his time has been occupied assisting Mr. Vance McCarty in sales work.

With the Chicago Belting Company Mr. Lindh will be in charge of its Pittsburgh direct factory branch, besides making personal engineering surveys for many of the larger users of belting throughout the United States.

Appoint New Agents

Hungerford & Terry, Inc., manufacturers of water filters in Philadelphia, Pa., have appointed the Hurricane Engineering Company, of 53 State Street, Boston, Mass., selling agents for their apparatus in the New England territory.

The managing director of the Hurricane Engineering Company is E. L. Smith, for years the New England representative of the Philadelphia Drying Machinery Company. The entire line of water filters, water softeners, iron removal plants, hypochlorite feeds and other feeding devices manufactured by Hungerford & Terry, Inc., will be handled by the Hurricane Engineering Company.

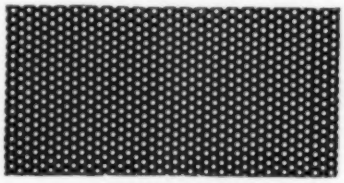
A New Bulletin, published by the M. J. Dougherty Co., piping fabricators and engineers, of Philadelphia, has interesting comments on the importance of the piping system and the value of proper design and erection. In brief, concise language easily understood by anyone, it gives the busy executive a comprehensive outline of the essentials of modern piping practice.

"Preparing for a Boom" is the title of a handsome little booklet just issued by the Hart Roller Bearing Co., of Orange, N. J. It gives some valuable information on the subject of roller bearings, a subject that should be interesting to every paper manufacturer, who is looking for some method for cutting down his power consumption, or in other words, saving part of his coal bill.

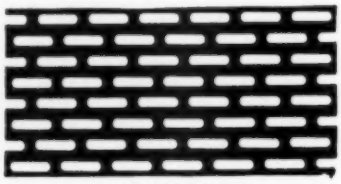
George A. Weaver, President of Industrial Manufacturing Co., Indianapolis, Ind., and others plan to erect a paper pulp mill at Orlando, Fla., at a cost of $300,000.

UNION
RENEWABLE AND NON-RENEWABLE FUSES
UNION RENEWABLE
UND. LAB. INSP.
UNION
25
60
UNION
Links that Save Time and Temper
It requires considerable time and patience to bend a STRAIGHT link at just the correct place to properly fit into a Renewable Fuse. Usually one end is bent just too much or too little to expose the figures under the windows in the cap, and to make proper contact at the other end.
To eliminate this difficulty, "Union" Renewable Fuses come with one end bent to the proper length. Simply drop the link into the casing, slip on the washers, tighten caps with the fingers, and the fuse is ready for service. Time? Less than it takes to tell it.
This is only one of a number of exclusive features which make "Union" the easiest and quickest fuse to renew.
"Union" Fuses, both Renewable and Non-Renewable, are for sale by leading electrical jobbers and dealers. The National Board of Fire Underwriters have given both types their very highest approval.
Free Descriptive Booklet Sent on Request
The "Union" saves more than ANY other renewable fuse
Chicago Fuse Mfg. Co.
Manufacturers of Switch and Outlet Boxes, Cut-Outs, Fuse-Plugs, Automobile Fuses, Renewable and Non-Renewable Enclosed Fuses.
UNION RENEWABLE
UND. LAB. INSP.
600
CHICAGO
NEW YORK

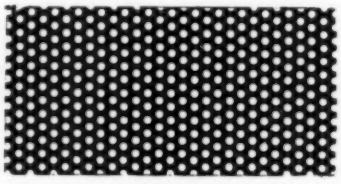
Perforated Metal Screens for Pulp and Paper Mills



.065 inch round



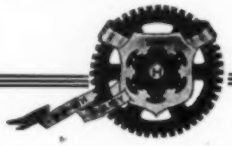
⅛ x ½" Slots



3/32 inch round

Steel, Copper, Brass, Bronze and other alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.

CHARLES MUNDT & SONS 57-65 Fairmount Avenue, Jersey City, N. J.



Plant and General Office at Cleveland, Ohio

Hill Clutch Equipment for Transmitting Power

In Pulp and Paper Mills

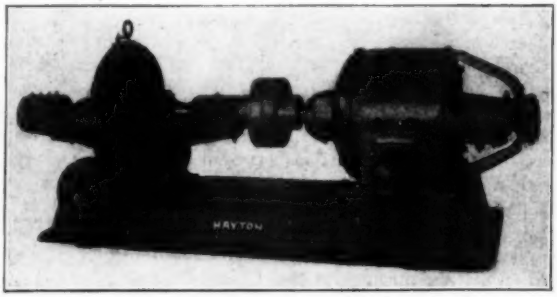
THE HILL CLUTCH CO.

General Office and Plant CLEVELAND, OHIO
New York Office, 50 Church Street

Hayton Centrifugal Pumps

SAVE POWER and MONEY

BY USING



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"With us it is an engineering problem"

Designed especially to meet the requirements of pulp and paper mills. We do not build a pump after OUR ideas and then try to sell it to you. We make a study of YOUR peculiar problems, and then build a pump to suit your needs. Hayton Pumps are built for hard, continuous operation, and will stand up under the most severe usage. We guarantee the highest efficiency, and maximum economy in power consumption.

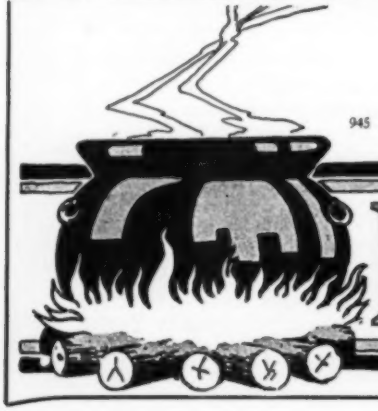
We also build a full line of Sandusky Triplex pumps.

Let us have your specifications for quotations

Hayton Pump & Blower Co.

Manufacturers

APPLETON, WISCONSIN



SWENSON EVAPORATOR CO.

Main Office	Eastern Offices	Works	
945 Monadnock Block, Chicago	519 Widener Bldg., Philadelphia 30 Church St., New York	Angola, Indiana Bedford, Indiana	Harvey, Illinois Joliet, Illinois

Cable Address, "Evaporator Chicago," Western Union Code

SWENSON EVAPORATORS

News Personals

F. A. Cosby, until recently with the American Writing Paper Company in Holyoke, Mass., has joined the sales staff of the J. E. Linde Paper Company, of 84 Beekman street, New York City. Mr. Cosby became associated with the Engineering Experimental Section of the Department of Technical Control of the American Writing Paper Company following his graduation from college, and has received excellent training in paper manufacturing of both practical and technical character. In his new connection he will specialize in the marketing of blue print, drawing, announcement and water marked papers.

William D. Duryea, formerly with the firm of Wilkinson Bros. & Company in New York, has severed his connection with that concern to join the pulp department of the Penobscot Fiber Company, of 49 Federal street, Boston, Mass., in a selling capacity. Mr. Duryea was in the New York office of the Ticonderoga Pulp & Paper Company for some years prior to his enlistment in the U. S. Marine Corps in June, 1918, and after the war went with the Wilkinson company.

A. Katzenstein, dealer in and importer of papermakers' supplies for the past 40 years, and Joseph F. Keene, who has been associated with him for the last six years, have incorporated under the firm name of Katzenstein & Keene, Inc., and will continue to do business at 63 Park Row, New York City, specializing in imported rags for paper mills. Mr. Katzenstein is at present in Europe, where he is studying business conditions and making new connectons for his firm.

Charles E. Foster has been appointed New England Sales Manager for The Calco Chemical Company and assumed his duties at their Boston office, 35 Hartford Street. This office carries in stock the entire line of Calco colors, and was established for the convenience of the New England trade. Mr. Foster is very well known to the trade, having had a broad experience in both mill and sales work.

Earl F. Heimpel, M. E., formerly chief engineer of the Edison Portland Cement Co., Stewartsville, N. J., has resigned to enter the sales force of the M. J. Dougherty Co., piping fabricators and engineers of Philadelphia. Mr. Heimpel, who is a graduate of Lehigh University, has had a wide and varied experience in the engineering field and will be located in the home office.

William C. Steck, for the past several years in the paper stock department of the Maurice O'Meara Company, of New York, and prior to that time with Edwin Butterworth & Company, of New York, has organized his own business under the name of William C. Steck & Company, with offices at 15 Park Row, New York City, to deal in all kinds of papermaking material.

A. G. Sleicher, manager of the wood pulp department of the E. J. Keller Company, Inc., dealers in and importers of papermakers' supplies, of 200 Fifth avenue, New York, has gone to Europe for the purpose of visiting pulp manufacturers in the Scandinavian countries. Arthur Herman has joined the E. J. Keller Company, Inc., as a salesman.

The Pulp and Paper Trading Company, of 21 East Fortieth street, New York City, has been appointed agent for the sale of coated lithograph and printing papers manufactured by the Ware Coated Paper Company, of Ware, Mass.

The High Falls Pulp and Paper Company, of High Falls, N. Y., has filed notice of an increase in capital stock from $150,000 to $600,000.

UNION SCREEN PLATE CO.
Fitchburg, Mass., U. S. A. Lennoxville, P. Q., Canada

UNION BRONZE SCREEN PLATES
(Best phosphorized Cast Metal)

Old Plates RECLOSED and RECUT to accurate gauge
UNION BRONZE SCREWS for Screen Plates
Immediate Delivery of the Largest Orders. Satisfaction Guaranteed

The Witham Screen Plate Fastener, Patented
THE ORIGINAL THE BEST

SCREEN PLATES *and* DANDY ROLLS

Watermarking a Specialty

Central Manufacturing Co.
The Quick Service House
KALAMAZOO MICHIGAN

Remember
WM. A. HARDY & SONS
FITCHBURG, MASS.
Originators and Oldest Manufacturers
OF THE
Cast Bronze Screen Plate
ALSO SPECIALIZE IN
Acid Resisting Digester Parts

Ticonderoga Machine Works
TICONDEROGA, N. Y., U. S. A.
MANUFACTURERS OF
WARREN IMPROVED CALENDER DOCTORS
With Flexible Blades, Universal Adjustment and Control
(PATENTED)
WARREN IMPROVED PATENT DOUBLE DRUM WINDERS
Patent BALL VALVE Hydrant
Stock Circulating Systems *and*
other Paper Mill Specialties
SEND FOR OUR BULLETIN

FASTEST DELIVERY

In New England on

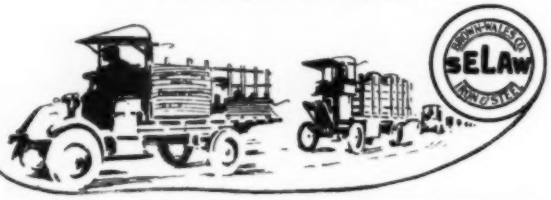
Iron and Steel

and Kindred Products

Fast and prompt delivery often means to the buyer the saving of considerable time and money. When in need of anything in building construction materials, in iron or steel—however large or small—or for the machine shop or garage shop, our larger stocks, our own fleet of motor trucks and nearness to terminal and shipping facilities assure the FASTEST delivery in New England.

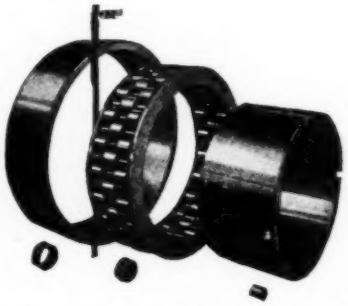
BROWN-WALES CO.

Fort Hill 6100. Boston 9



Correct Design

Each **Short** Roll carries only its own proportion of the load; because all rolls in an assembly are of the same diameter. These Short Rolls do not become conical.



Rolls and races are truly cylindrical. Uniform load distribution is therefore maintained in

"The Quality" BEARING

Has **Greater** Capacity than other bearings

Made only by

S. A. E. Standards
Radial and
Thrust Types

The Hart Roller Bearing Co.

Orange, N. J.

JENSSEN ACID TOWERS
at Nekoosa Edwards Paper Co.
Port Edwards, Wisconsin

66 Jenssen Tower Installations

GREAT ECONOMY has been effected in mills where the

JENSSEN Two-Tower Acid Systems

have been installed

Sixty-six Installations now in operation or building

U. S. A., Canadian and European Patents

G. D. Jenssen Co.

200 Fifth Ave., New York

STACKS BREECHINGS TANKS

Our erecting facilities are such as to make it possible for us to replace or repair smoke stacks in any part of the United States.

LITTLEFORD Steel Smoke Stacks and Flues are ENGINEERED to suit the individual requirements of every purchaser. The design and methods employed in their erection are the results of over thirty years' experience.

Our engineering ability and experience is at your disposal for the asking.

LITTLEFORD BROS.

500 E. Pearl St., Cincinnati, O.

E. A. Flanagan, well known in the paper trade in New York, has moved his office to 405 Lexington avenue, New York City. Mr. Flanagan is making arrangements to import wood pulp from Germany and the Scandinavian countries, and will also conduct a wholesale business in news print, wrapping and other kinds of paper and box boards.

Harry Elias, for 18 years with Coy, Hunt & Company, of New York, and one of the best known paper salesmen in the New York district, has entered business on his own behalf under the firm name of Harry Elias & Company at 21 East Seventh street, New York City. He will specialize in coarse papers, board, twine and paper specialties.

Ralph Snell, of the Paper Makers' Chemical Company, of Holyoke, Mass., returned home during the last week of August from an extensive business trip to Europe, where he traveled through England, France, Germany, Holland, Belgium and the Scandinavian countries. Mr. Snell was on the other side for about three months.

Stuart D. Lansing, president and general manager of the Bagley and Sewall Company, of Watertown, N. Y., sailed from New York for Europe several weeks ago to join Mrs. Lansing and their daughter and to remain abroad until just before Christmas. Mr. Lansing's trip abroad is strictly on pleasure.

Offices of the Andrew Ragone Company, Inc., dealers in paper mill supplies, have been moved from 15 Park Row to the warehouse and packing plant of the concern at 321 Pearl street, New York City.

Offices of J. F. Patton & Company, Inc., paper and wood pulp dealers, have been moved to the Canadian Pacific Building, 342 Madison avenue, New York City.

Contest Closed

The Contest conducted by THE PAPER INDUSTRY during the twelve-month period ending September 30th has now terminated. The results have been most gratifying to the publisher.

Numbers of articles have been written and submitted which treat of nearly every phase of the manufacturing and administrative departments in the industry. Many have already been published and a large number of those received and accepted are yet to appear.

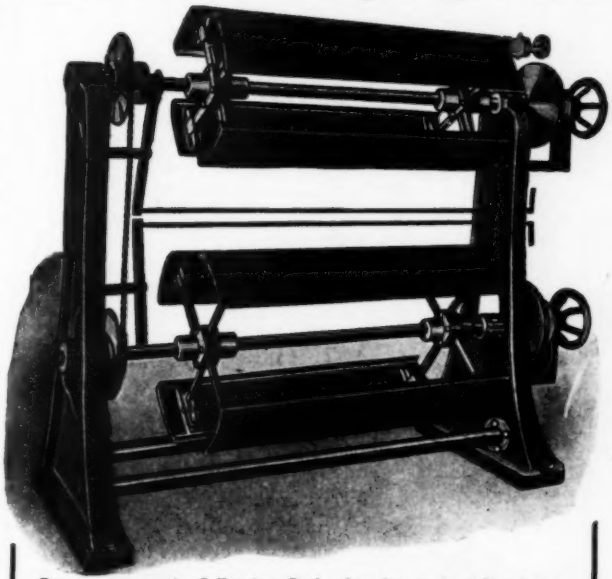
The November issue will contain the names of the judges who have been selected to award the prizes, and it is hoped that, by then, the names of the winners can also be given.

When all the articles which have been accepted are published, a complete list giving the title of the article, the name of the author, and the issue in which it appeared will then be published.

"NORTHERN" Cranes and Hoists

Northern Engineering Works Detroit, Michigan

Automatic Collapsing Reels



Double Automatic Collapsing Reel. Can be used with printing presses, crepe machines, or any place where it is desired to cut up the product into napkins, bottle wrappers or any sized sheets.

Write for catalog, PAPER MACHINERY

HUDSON-SHARP MACHINE CO.

Green Bay, Wis.

GIBBS BROWER COMPANY

Selling Agents

281 Broadway, New York, N. Y.

FLY BARS

Bed Plates Jordan Fillings

KNIVES

Uniformly High Grade
Quality and Finish

Order BOLTON QUALITY next time

John W. Bolton & Sons, Inc.

LAWRENCE, MASS.

HAMMERMILL BOND
HAMMERMILL

SAFETY
HAMMERMILL LEDGER
HAMMERMILL COVER
The Standard Utility Business Papers and the Most Widely Used Papers in the World
MADE BY
HAMMERMILL PAPER CO., Erie, Pa.
NEW YORK OFFICE: 231 BROADWAY

Lincoln Paper Mills
ELKHART, IND.

Manufacturers of

Machine Finish Writings

Machine Finish and Super Calender White and Colored Book

Extra Machine Finish and Super Calender Litho

Mimeograph and Specialties

The
Hinde & Dauch Paper Co.

Corrugated Fibre Shipping Boxes and Packing Materials of Acknowledged Superiority

Sales offices in principal cities

MAIN OFFICE
SANDUSKY, OHIO

WOLVERINE Paper Company

"Wolverine" Waxed Papers for Every Requirement

Best Quality

Waxed Tissue a Specialty

OTSEGO, MICHIGAN

BUSINESS in almost every kind of paper has shown consistent improvement during the past few weeks, and the industry is now experiencing a greater measure of activity than has been evident at any time in the course of the present year. The improvement is quite broad in scope and is being felt in practically all branches of the trade. Manufacturers are securing a good deal larger volume of orders and are consequently steadily increasing their production, jobbers are busier filling the wants of customers, while converters of paper and manufacturers of paper products are enjoying a substantial expansion of demand for their goods. Not in a lengthy interval has the industry as a whole been in such a favorable and promising condition, and a most pleasing feature of the situation is that the growth in demand for paper and paper products has all the earmarks of being distinctly healthy.

It has been the contention of most members of the trade that the autumn would witness a marked revival of activity in the paper industry, and the predictions of those taking this view seems to be reaching a stage of realization. Obviously the improvement is due to manifold causes, the most important of which is the general resumption of industrial activity throughout the country. The numerous paper-consuming industries are gradually though steadily becoming livelier, with the result paper consumption is on the rise. Moreover indications point to an uninterrupted expansion of business in various lines now that the summer is over and the business world settles down to its normal fall status. Bankers, manufacturers and merchants in various parts of the country freely express the opinion that the period of liquidation and readjustment is rapidly drawing to a close, that with commodity prices down to nearer normal levels and the consuming public regaining confidence in the stability and reasonableness of prices that business conditions will continue to undergo improvement, thus making for broader retail trading and a larger volume of manufacturing.

A highly encouraging feature in the paper trade today is the pronounced confidence existing among producers, mill agents, distributors and retailers. Everyone appears to be possessed of unlimited faith in the future of the industry. There is scarcely a note of pessimism heard in any quarter. Of course, some take the view that it will require a longer space of time for matters to get back to normal than others expect, but there is a unison of belief that the paper industry is back on the road to a healthy activity of broad scope. It can be stated that a consensus of opinion is that the reawakening of demand from consuming fields during the past few weeks is the beginning of a period of good business in paper. There are many who look for the market to reach complete normalcy within the course of the next several months, though others stick to the belief that business will continue to be somewhat under average proportions until next spring. Whatever happens to be true, the developments in recent weeks have been sufficient to immensely buoy up sentiment in the trade as well as to be creative of a much livelier market condition.

Probably the best proof of the improved status of the market is the advancement that has occurred in prices on several kinds of paper, which could not have come about had it not been for a broader demand for those descriptions of paper concerned. Kraft wrapping papers have risen an average of half a cent per pound under the stimulus of increased consumption and a larger demand from consuming quarters. Box boards have advanced appreciably in price. Tissue papers, while remaining at about previous quotational levels, show a strong upward price tendency. The general trend of paper prices, with some exceptions, is toward higher levels, which would seem to emphasize that paper values were permitted to go to unwarranted low levels during the period of business depression since last fall.

The news print market is exhibiting more firmness than has been evident in a long time. The revision of the contract basis on roll news by leading manufacturing interests down to 4 cents per pound, or $80 a ton, f. o. b. mills for deliveries over the final quarter of the year, together with a gradual increase in consumption, are bringing publishers into the market for substantially larger amounts of print paper, and improvement in this branch of the industry seems assured as the winter draws near and pre-holiday advertising campaigns are instituted. There has been a good spot demand for news print, indicating that publishers have found it necessary to augment contract supplies through open market purchases, and all reports from producing centres tell of mills operating at a livelier pace at present than in many months.

Representative manufacturers of wrapping paper recently announced an advance of half a cent per pound in kraft wrappings, and whereas the price of No. 1 domestic kraft wrapping had worked down to 5.50 cents a pound, the lowest figure quoted now is 6 cents, with some mills obtaining 6.50 cents for their product. Moreover, it is stated that most wrapping paper manufacturers have enough business booked to keep them busily engaged for a period of two months and longer. Tissues are enjoying a steady and fairly broad demand, and quotations are firm at around a basis of 90 cents per ream for No. 1 white tissue. There is also a large demand for tissue specialties in the form of paper towels, napkins and toilet tissues.

Fine papers are moving in considerably increased amounts and are firming in price. Practically all the writing paper mills are running at least half time, with some operating full, whereas not so long ago many of these plants were closed down entirely. The slowest division of the trade at present is book paper. Largely due to unsettled conditions in the printing trade the country over, demand for book papers has not expanded in proportion with that for other kinds of paper, and competition among manufacturers for such business as is to be had makes for a rather easy price tone. Machine finished book paper has sold in the East down to 5.75 cents per pound f. o. b. delivery points, and super book at as low as 6.25 cents, though a nearer average of quotations is about a quarter to a half cent above these prices.

The sharp rise in raw material costs, coupled with a broadening of demand from box makers, have sent board prices bounding upward, and plain chip is now quoted at $40 and higher per ton and news board at from $45 upwards, representing an advance of approximately $10 per ton above recently prevailing prices.

Good paper can be made from the common eucalyptus, experiments to that effect having been made in West Australia. Various state governments and private interests have contributed upward of $100,000 for the erection of plants and the installation of machinery for further investigation into the matter.

RUSS GELATIN CO.
Factory—WESTFIELD, MASS.

MANUFACTURERS OF

GELATIN and GLUE
ANIMAL SIZING GLUE STOCK

LARGEST SPECIALISTS IN AMERICA ON
FINE WRITING PAPER SIZING

E. F. RUSS COMPANY 201 Devonshire S. BOSTON, U. S. A

IMPORTED TALC DOMESTIC

We are also Headquarters for:

BLACKS
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BINNEY & SMITH CO.
81 Fulton Street New York

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Assorted Waste Paper in Large Quantities

240 North Front Street, Philadelphia

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FREDERICK BERTUCH, SPECIAL PARTNER
21 East 40th Street, New York City

Importers of Chemical Pulps
BLEACHED AND UNBLEACHED

Agents for Kellner Partington Paper Pulp Co., Ltd.
Sarpsborg, Norway; Forshaga, and Edsvalla, Sweden;
Bergvik and Ala Nya Aktiebolag, Söderham, Sweden

ESTABLISHED 1895

Daniel M. Hicks
INCORPORATED

FOREIGN and DOMESTIC
Rags, Bagging, Rope and Waste Paper

Pulps, Chemicals, Colors, Wires, Felts, Clay, Casein, etc.

DANIEL M. HICKS, Inc.
INCORPORATED
IMPORTERS DEALERS
200 Fifth Avenue NEW YORK CITY

Paper Stock

Now Is the Time to Buy Our Raw Materials

Out of the forty different kinds of paper stock graded in our many large warehouses, you are assured a steady, reliable source for procuring raw materials in practically every branch of paper making.

Having specialized for 35 years in this one field you can depend upon a clean, well-packed, uniform product throughout; fulfillment of delivery promises; and because of our output of 300 tons daily, big tonnage at all times.

Write us your wants and we'll gladly send further information.

Mendelson Bros. Paper Stock Co.
910 South Michigan Avenue, Chicago, Ill.
Long Distance Phones: Harrison 2840 and 5557.

Papermaking Rags

Generally speaking, the papermaking rag market shows a steadier tone than has been evident in some time. The decline in prices seems to have been definitely checked and there is an upward trend in some grades, with dealers and packers in various parts of the country exhibiting a firmer attitude and exerting less effort to dispose of stocks. On the other hand, demand from consuming quarters continues at best light. There are few paper mills buying in other than hand-to-mouth fashion, and the average mill appears to still have a comparatively large quantity of rags in store, which precludes the necessity of placing orders for additional supplies except in a small way. Sentiment among those on the selling side of the trade, however, is that demand for rags will certainly expand in the near future, particularly so in view of the limited buying by mills for such a lengthy period, and stocks in dealers' establishments are consequently held with a good deal of firmness.

Rag dealers argue that there is little incentive for them to try to market rags at present. The prices obtainable from consumers are in most cases below the cost of replacement of the stock sold, and it is contended that everything is in favor of higher prices ruling during the course of the next few weeks. There seems no doubt that collections of rags all during this summer have been lighter than in years, and rag dealers appear more disposed to consider this phase of the situation than that of a low consumption, owing to paper mills having operated on greatly reduced schedules. It is the dealer's contention nevertheless that rags are a commodity that are worth lots of money when in demand but are next to valueless when not wanted by consumers, and it is felt that when paper mills resume buying in something approaching normal volume—which it is confidently believed will soon be the situation—prices on rags will materially improve their position.

New cuttings have firmed up in price to a considerable degree. This appears largely due to most of the supplies getting into strong hands, and also to the small amounts of new rags coming forward from clothing houses. Dealers are especially bullish concerning cuttings and are holding most grades at advanced prices. New white shirt cuttings are quoted at 9 cents per pound at shipping points for No. 1 quality goods, while blue overall cuttings are held for 5.50 to 5.75 cents per found, fancy shirt cuttings at 5.25 to 5.50 cents, unbleached muslins at 7.75 to 8 cents, and No. 1 washables at 3.25 to 3.50 cents.

Roofing rags have strengthened in value, with sales of No. 1 packing reported in the West at 1.10 cents a pound at dealers' points and in the East at 90 cents per hundred pounds. It is quite likely that should prices on roofing stock rise a little further considerable supplies would come into the country from European sources, where it is understood stocks of fair dimensions are available but are held for better values. Old whites are in rather slow demand and old blues are moving in but small quantity.

Average quotations f. o. b. shipping points follow:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	8.75-9.25
White shirt cuttings, No. 2	5.75-6.25
Fancy shirt cuttings	5.25-5.75
Washables, No. 1	3.25-3.50
Unbleached muslins	7.75-8.00
White lawns	7.50-7.75
Overall cuttings, blue	5.50-5.75
Black silesias	3.00-3.25
Old Stock—	
Whites, No. 1 repacked	4.50-5.00
Whites, No. 2 repacked	2.50-2.75
Whites, house soiled	1.25-1.50
Whites, street soiled	1.00-1.15
Thirds and blues, repacked	1.50-1.75
Thirds and blues, rough	1.00-1.15
Black stockings	1.50-1.65
Lace curtains	4.25-4.50
Cotton canvas, No. 1	3.00-3.25
White cotton batting	1.20-1.40
Roofing, No. 1	.90-1.10
Roofing, No. 2	.80-1.00

Rope and Bagging

Along with most other descriptions of papermaking material, old rope and bagging are showing an improving tendency and are moving into consuming channels in steadier fashion. Old rope particularly is firm. Demand for this article has gradually but consistently increased and prices have advanced to a minimum of about 4.25 cents per pound at shipping points for domestic manila rope in No. 1 condition, with some sales reported at slightly in excess of this figure. All indications point to old rope being in limited supply. Dealers assert that they are not getting anywhere near normal amounts from producing sources and that added efforts to locate supplies usually meet with disappointment. This condition is probably due to the situation existing in recent months in the shipbuilding and shipping industries, where most of the supply of old manila rope has its origin. Strings are in rather slack demand and are quoted by dealers at around 70 cents per hundred pounds.

Demand for old bagging is not nearly as active as for rope and available supplies are unquestionably larger. Old No. 1 scrap bagging is quoted at from 75 cents a hundred upward at dealers' points, No. 1 gunny at around $1 per hundred and roofing at 60 to 65 cents.

Quotations f. o. b. shipping points are:

	New York and Chicago
Gunny, No. 1 domestic	1.00-1.10
Gunny, No. 1 foreign	.90-1.00
Scrap bagging No. 1	.75- .85
Roofing bagging	.60- .65
Wool tares, heavy	1.50-1.75
Wool tares, light	1.25-1.50
Manila rope, No. 1 foreign	4.00-4.25
Manila rope, No. 1 domestic	4.25-4.50
Sisal strings	1.50-1.75
Mixed strings	.65- .75

Old Papers

What could be correctly termed a mild boom exists in the old paper trade. Demand has broadened to a substantial extent and prices have bounded upward at a rate that has been surprising, while the trend continues to be strongly upward. As is usually the case in a rise in waste paper, the advance has been aided by a good deal of speculative trading among dealers, but the real reason for the sharp jump in values has

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Bleached and Unbleached
WOOD PULP
of Every Description

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been heavier buying on the part of consuming mills with available supplies of most grades of material on a proportionately lower level than they have been in a long time. During the spring and summer months when old paper was scarcely saleable to paper and board mills excepting in small lots, large quantities of waste were destroyed because it did not pay collectors to gather it. Then, too, dullness in the printing, book binding, publishing and other producing trades for some months past has decreased the output of waste paper. When consuming mills increased their buying it did not take long for stocks in packers' hands to be removed, and there is now a more or less scarcity of old paper. Dealers naturally have taken advantage of this and have repeatedly advanced quotations, with present indications pointing to a further rise in prices before the forward movement of values is checked. However, with prices so much higher than they were, collections will doubtless increase, which should in due time have a checking influence on the rise in prices.

Old books and magazines have scored a broad jump in price and are now quoted by dealers at 1.50 cents and higher at shipping points for No. 1 heavy books. Shavings are quoted at such a wide range that it is rather difficult to say what definite market levels are, though an average of quotations are about 3.50 cents a pound for No. 1 hard white and 2.85 cents for No. 1 soft white shavings. Old kraft has advanced to 2 cents per pound, white blank news cuttings to 1.75 cents, No. 1 manilas to 1.10 cents, and ledger stock to 1.70 cents. Old folded newspapers are selling at 65 to 75 cents per hundred pounds and No. 1 mixed paper at 50 to 60 cents, depending on the tonnage involved and the section of the country in which purchases are made. Prices have gone up to a level where it is said some mills are finding it relatively cheaper to use wood pulp, with the result that some consumers are switching from waste paper to pulp.

Quotations f. o. b. shipping points follow:

	New York and Chicago
Hard white shavings No. 1	3.40-3.60
Hard white shavings Nos. 2-3	2.00-2.50
Soft white shavings	2.75-3.00
Colored shavings	1.50-1.75
Heavy book, No. 1	1.50-1.60
Crumpled No. 1	1.20-1.30
Ledger stock	1.60-1.75
Kraft No. 1	2.00-2.10
Manilas, No. 1	1.00-1.10
White blank news	1.65-1.75
Overissue news, No. 1	.85- .95
Folded news	.65- .75
Mill wrappers	.70- .80
Box board cuttings	.60- .70
Mixed paper, No. 1	.50- .60
Common paper	.35- .40

Chemical Pulp

Agitation against the dumping of pulp into this country by European manufacturers has served to strengthen the tone of the chemical pulp market. Only in exceptional cases have quotations been advanced to any material degree, but there is a firmer situation in all quarters of the market and a good deal less anxiety shown by sellers to dispose of pulp stocks. The steadying of the market has been helped by a broader demand from consumers; paper and board mills in general having increased their buying to a more or less extent, and thus making for a livelier as well as firmer market condition.

There seems little question but that foreign pulp is keeping domestic pulp down in price. Frequent complaints are registered by domestic producers over their inability to make pulp profitably at ruling market values, but in order to compete with the imported article they must necessarily name prices somewhere in the proximity of the figures at which the Swedes and Germans are marketing pulp for here. Leading domestic

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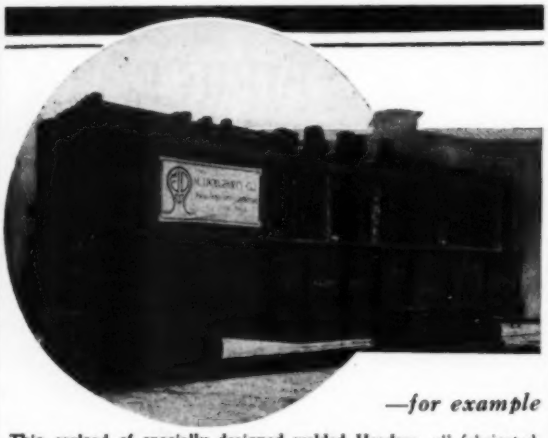

—for example

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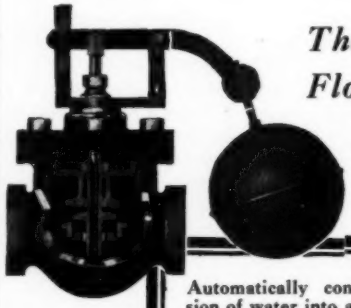

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A Variable Speed DISC FAN

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The Fan with variable speed control and a constant speed motor. No rheostat, or troublesome brush shifting device. Simply vary the belt tension to vary speed from 2½ to 100% of full speed. A plain highly efficient, common sense fan that is as near trouble proof as a fan can be.

Patented Ventilated Pulley with a cooling draft of air passing through the core prevents heating or burning of belt. Acid proof belt guaranteed for one year.

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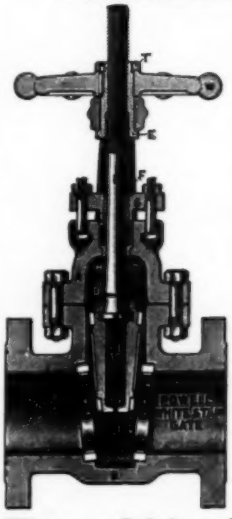

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DEPENDABLE ENGINEERING SPECIALTIES.
CINCINNATI, O.

manufacturers of bleached sulphite quote 4.25 cents a pound at pulp mills on No. 1 bleached, while No. 1 unbleached sulphite is quoted at about 2.75 cents, easy bleaching at 3 cents, bleached soda pulp at 4.25 cents and No. 1 kraft at 2.50 cents. Concessions are being granted quite often, however, and prices therefore are somewhat uncertain.

F. o. b. pulp mill quotations are approximately as follows:

Bleached sulphite	4.00-4.25
Easy bleaching sulphite	3.00-3.25
Unbleached sulphite No. 1	2.75-3.00
News grade sulphite	2.50-2.75
Soda pulp, bleached	4.00-4.25
Mitscherlich unbleached	3.50-3.75
Kraft No. 1	2.50-2.75
Screenings, refined	.85-1.00

Mechanical Pulp

A firm undertone characterizes the mechanical wood pulp market and reports generally state that business is of fairly broad dimensions. Consumers are buying in a steady way, although mainly for direct requirements, and quotations, although having shown no appreciable advance in recent weeks, hold quite firm at previous levels. Domestic spruce ground wood, freshly ground, for prompt shipment is bringing between $29 and $30 per ton at pulp mills, with now and then a sale reported at slightly lower figures but with a majority of producers holding for at least $29. Some imported ground wood is being offered at concessions from the domestic article, prices down to $24 a ton on the dock having been mentioned, but on the wohle importers are securing prices very close to those at which domestic pulp is selling.

It is generally admitted that ground wood stocks are not large; that, if anything, they are below normal, owing to water conditions in most grinding localities this summer. However, available supplies appear to be ample to cover the wants of consumers at present, though it is freely acknowledged that should consumption undergo any large increase a shortage of ground wood might develop. It is this possibility of a shortage that is one of the sustaining market factors.

Chemicals

Trade activity in papermaking chemicals is moderate, though the bulk of it at this time concerns contract business. Most paper and pulp manufacturers are getting along fairly well with contract commitments and consequently are doing little buying of importance in the spot market. Quotations, with one or two exceptions, hold steady. Casein has declined further to between 6 and 8 cents per pound, depending on the grade and quantity wanted, and blanc fixe is down to 4 cents for the powdered article. Bleaching powder is quoted at between 2 and 2.50 cents a pound at works in domestic drums, brimstone at $15 and $16 per long ton at the mines, caustic soda at around 2.50 cents for spot delivery, and soda ash at around 2 cents per pound for the 58 per cent light product in bags for prompt delivery. Quotations follow:

Alum, lump ammonia	3.50- 3.75
Alum, lump starch	4.00- 4.25
Blanc fixe, powdered	4.00- 4.25
Bleaching powder (domestic drums)	2.00- 2.50
Brimstone (ton)	15.00-16.00
Casein	6.00- 8.00
Caustic soda, spot delivery	2.40- 2.60
China clay, domestic washed	9.00-10.00
China clay, foreign	14.00-18.00
Rosin, grade E	5.30-
Satin white	2.00- 2.25
Soda ash, 58 per cent light (bags)	1.90- 2.10
Sulphite of alumina, commercial grade	1.60- 2.00
Starch, papermakers', in bags	2.20- 2.40
Talc (ton)	17.00-18.00

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Newport Acid Bordeaux B Conc.
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Barium Chloride
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Trisodium Phosphate
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Fast Red
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Croceine Orange
Safranine Y
Orange Y
Meldola Blue
Fuchsine
Auramine O and OO Conc.
Malachite Green, Crys. & Powd.
Tartrazine
Methylene Blue
Methyl Violet
Soluble Blue
Victoria Blue
Bismark Brown
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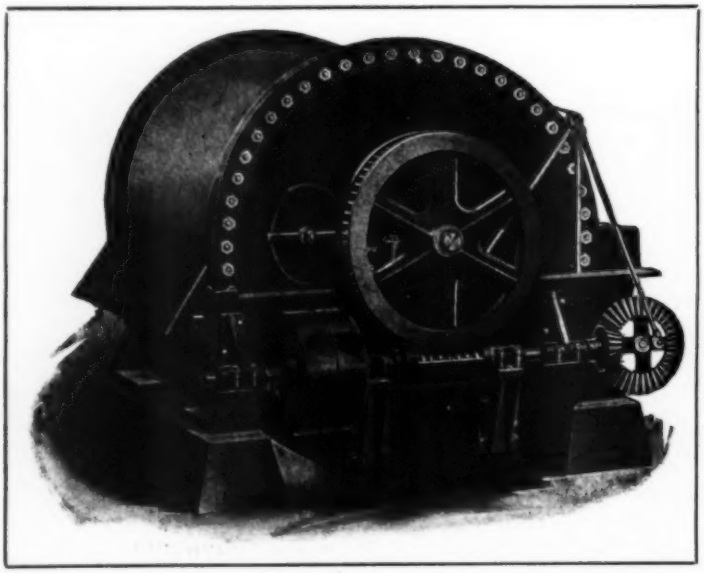
Improved Rotary Continuous Suction Filter



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Glamorgan Pipe and Foundry Co., Lynchburg, Virginia

New Papers

Writing—	
White rag	13-40
White sulphite, No. 1	9-20
Colored	11-20
Ledger—	
White rag	14-50
White sulphite	11-25
Colored sulphite	13-25
Colored rag	16-50
Bonds—	
White rag	10-40
White sulphite	8-20
Colored sulphite	10-22
Colored rag	12-40
Book—	
No. 1 S. & S. C	6.25- 7.00
Machine finished	5.75- 6.50
English finished	6.50- 7.25
Coated and enameled	8.50- 9.50
Lithograph, M. F	9.50-11.00
News Print—	
Rolls, contract	4.00-
Rolls, transient	4.25- 4.50
Sheets	4.75- 5.00
Side runs	3.50- 3.75
Cover Stock—	
Soated, both sides	9.25-
Coated, one side	9.20-
Tissue—	
No. 1 white, 20x30	.80- 1.00
No. 2 white, 24x36	.80- .90
No. 1 manila, 24x36	.80- .90
Kraft	.90- 1.15
Wrappings—	
No. 1 kraft	6.00- 6.50
No. 2 kraft	5.50- 6.00

Boards—

	New York and Chicago
Solid news	45.00-50.00
Straw	40.00-45.00
Plain chip	40.00-45.00
White coated chip	60.00-70.00
Manila coated chip	55.00-60.00
Binders' board	75.00-85.00

Secretary Burke Addresses National Association of Cost Accountants

During the convention held by the National Association of Cost Accountants in Cleveland, Ohio, on Friday, September 16, 1921, Thomas J. Burke, Secretary-Treasurer of the Cost Association of the Paper Industry, made the following remarks:

"I represent the Cost Association of the Paper Industry, which exists primarily for the purpose of urging the installation of efficient cost systems generally throughout the pulp and paper industry.

"We do not attempt in any way to invade the territory of the public accountant; in other words, we do not undertake the installation of cost systems, but we do undertake to advise and suggest, also to co-operate with those accountants who are working on the installation of cost systems in pulp and paper mills.

"I want, therefore, to ask those public accountants here who have had experience in installing cost systems in pulp or paper mills to kindly communicate with my association at 18 East Forty-first street, New York, N. Y. My object in making this request is that we want to be absolutely unbiased when advising those executives who ask us for suggestions as to whom they should employ to do their cost work. Another reason is that we would like to do everything possible to standardize cost accounting procedure in our industry.

"We are hampered somewhat in our work of impressing upon executives the necessity for improved cost accounting methods, by the fact that different accountants have different ideas and use different methods.

"We would like to have all those public accounting concerns who are called in by pulp or paper mills to do system work to comply with certain "fundamentals" which the Executive Committee of our association has approved.

"I want to draw your attention to one very important aspect of this association work, namely, that if you gentlemen cannot see your way clear to standardize your methods when installing cost systems in pulp or paper mills, it will mean that we shall be forced to recommend to our members that they should take steps to form a cost bureau for the purpose of installing our own cost systems. Work of this nature is already being done in one division of our industry, namely, the Newsprint Division. I therefore make a direct appeal to the members of the National Association of Cost Accountants to take this matter under serious consideration if for no other reason than that it may prove of future financial benefit to many of its members."

Annual Convention of the Cost Association

The Sixth Semi-Annual Convention of the Cost Association of the Paper Industry was held at the Drake Hotel, Chicago, on October 6 and 7, 1921.

It is the first time in two years that the association has met near the western mills, where some of the most active local divisions are located and is in recognition of the progressive activities of paper mill cost accountants in the Middle West.

Owing to the convention meeting contemporaneously with the publication of this issue of The Paper Industry, a complete account of the meeting will appear in the November number. On another page, however, will be found a paper delivered by Mr. H. A. Wingate, assistant secretary, C. H. Dexter & Sons, Inc., on the subject, "Idle Time as a Manufacturing Loss." Another article appears in this number by H. V. Coes, entitled "The True Story of a Rejuvenated Mill," which contains some helpful suggestions.

Motion pictures showing the manufacture of paper are being made available for distribution by the American Paper and Pulp Association to educate the public to the importance of the industry.

The tonnage of paper produced in 1920 was 7,334,614, with board leading, the total being 2,313,449 tons, news, book and wrapping following in order.

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CONVEYING AND POWER TRANSMITTING MACHINERY

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FOURDRINIER WIRES

"In all widths up to and including 250 inches"

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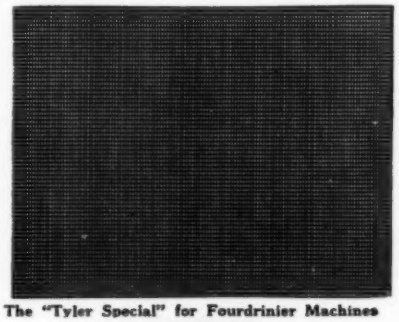
In Brass, Bronze and Phosphor Bronze

Tyler Fourdrinier Wires are dependable, reliable and durable.

The secret of durability is found in the special composition metal that is used in the make-up of the wire, and by reason of its substantial construction a long life with a large tonnage is assured.

Tyler Wires run straight with no inclination of becoming slack at the edges.

Prices and samples will be mailed upon request.



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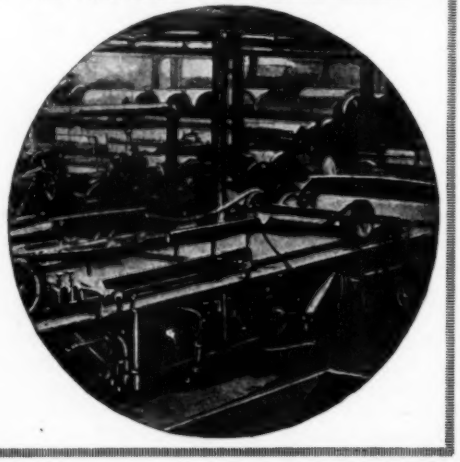

THE W. S. TYLER COMPANY

CLEVELAND, OHIO

Wood Pulp

Following a period of depression during which comparatively large amounts of wood pulp of European origin were offered in the American market at sharp concessions in price—frequently at figures substantially below those quoted by domestic producers—the foreign pulp situation has acquired an entirely changed complexion. There seems little doubt that agitation against the "dumping" of pulp into the United States by foreign manufacturers has been one of the principal reasons for the firming up of the market, because the pressure brought to bear on Government officials in Washington by domestic pulp producers and others interested was so strong that an investigation into the alleged dumping tactics of European producers was started, with importers in this country in the meantime required to put up a bond on practically every shipment of pulp brought in from German and Scandinavian sources. This obviously had the effect of stopping the consignment of pulp by manufacturers on the other side of the Atlantic to representatives here, and also made importers much more cautious in bringing in supplies on their own behalf, thus considerably reducing available supplies in this country for spot delivery to mills.

Moreover, primary market conditions have changed to a sufficient extent to help in strengthening the market in the U. S. It is understood on good authority that buying in Sweden and other European pulp countries recently has been of large enough tonnage to diminish unsold stocks held there and to make manufacturers firmer in their demands for better prices. Just for example, it is stated by a Swedish pulp authority who is now in the United States that sales of kraft pulp by Swedish pulp mills to American buyers in August and September were more than three times the production of this kind of pulp in Sweden for those two months. It is said that manufacturers in the Scandinavian countries have experienced many difficulties in recent months in the form of labor troubles, shortages of raw material, and the like, which have compelled them to limit their output to only about half of normal production.

The source of the cheapest pulp in Europe at present is Germany. This is partly due to exchange and partly to Germany's low cost of production, but the fact remains that the Germans are selling pulp to the United States and to other countries at prices below those prevailing in any other quarter.

What will be the outcome of the anti-dumping campaign now on foot in this country is problematical. The Government has instructed its trade representatives in the several European nations concerned in the matter to thoroughly investigate the facts bearing on the case and to make reports to Washington, and when these reports are all received it is likely a decision will be rendered as to whether or not the Scandinavians and Germans have been really dumping pulp supplies into the United States. Whether or not complaints of domestic producers are based on fact, it would appear that, from their individual point of view, their agitation against dumping has had some beneficial effect in that it has succeeded in strengthening prices on foreign pulps.

Scandinavian kraft, which at one time was down to 2 cents per pound, is now quoted at between 2.75 and 3 cents ex the dock at Atlantic ports, with spot stocks apparently liquidated and with a good demand emanating from paper mills. Unbleached sulphite of No. 1 grade is quoted at 2.50 to 2.75 cents ex dock, with Swedish pulp of this description firmly held for the higher figure. Bleached sulphite continues to be quoted at 3.75 to 4 cents per pound, and imported ground wood at from $27 to $30 a ton.

Receipts at the port of New York in September, and current quotations follow:

Bleached sulphite	$ 3.75- 4.00
Unbleached sulphite, No. 1	2.50- 2.75
Easy bleaching	3.00- 3.25
Mitscherlich unbleached	2.75- 3.00
Kraft	2.75- 3.00
Ground wool, per ton	27.00-30.00

Castle, Gottheil & Overton, 1,715 bls. from Rotterdam and 300 bls. from Hamburg; A. J. Pagel & Co., 875 bls. from Hamburg, 1,800 bls. from Gothenburg and 2,500 bls. from Gevle; Whalen Pulp and Paper Co., 10,208 bls. from Vancouver; Lagerloef Trading Co., 3,633 bls. from Helsingfors, 3,955 bls. from Mantyluoto and 9,426 bls. from Wyburg; Woodpulp Trading Co., 900 bls. from Kotka; American Woodpulp Corp., 1,300 bls. from Hamburg; Brown Bros. & Co., 168 bls. from Hamburg; Scandinavian-American Trading Co., 127 bls. from Copenhagen and 750 bls. from Gothenburg; H. Hollesen, 821 bls. from Hamburg; E. J. Keller Co., 6,871 bls. from Christiania and 550 bls. from Gothenburg; Seggerman Bros., 400 bls. from Gothenburg; E. M. Sergeant & Co. 350 bls. from Copenhagen; Order, 204 bls. from Kotka, 546 bls. from Rotterdam, 3,000 bls. from Christiania, 18,717 bls. from Helsingfors, 4,199 bls. from Mantyluoto, 5,425 bls. from Hango and 3,098 bls. from Wyburg.

Paper Stock

Importations of papermaking materials into the United States continue at a low point, though there has been some increase within the last week or two, thus reflecting the greater interest evinced by consumers in such goods. Occasional shipments of fair tonnage of rags were received during September, and there were routine supplies of old rope and other materials, but the aggregate amounts imported were far below normal. Importers assert that they are confining their purchases abroad almost solely to goods required to fill actual mill orders, which largely accounts for the light supplies coming in.

Arrivals at the port of New York in September follow:

Old Rope

Brown Bros. & Co., 1,140 coils from Hull and 76 coils from Bristol; E. N. Davey & Co., 64 bls. from Halifax; Bernard, Judae & Co., 11,056 rolls from Bordeaux; International Purchasing Co., 213 bls. from Havre; Atlantic National Bank, 128 coils from Liverpool; Order, 76 bls. from Rotterdam and 16 bls. from Gothenburg.

Old Bagging

American Woodpulp Corp., 249 bls. from Hamburg; E. J. Keller Co., 259 bls. from Antwerp and 34 bls. from Rotterdam; Irving National Bank, 57 bls. from Manchester; Edwin Butterworth & Co., 153 bls. from Antwerp.

Rags

Mechanics & Metals National Bank, 97 bls. from Trieste and 47 bls. from Bremerhaven; American Woodpulp Corp., 138 bls. from Bremerhaven; Atlantic National Bank, 48 bls. from Bremerhaven and 331 bls. from Hamburg; A. Katzenstein, 234

Bardeen Paper Co.

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For LETTERPRESS, OFFSET *and* LITHOGRAPHIC PRINTING

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Cornwall Pulp & Paper Co., Ltd., Cornwall, Ontario
Specialty Paper Mills, Ltd., Camden East, Ontario
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INCORPORATED
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PAPER MAKERS' SUPPLIES
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COTTON, JUTE AND FLAX WASTES
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bls. from Antwerp; Albion Trading Co., 75 bls. from Havre; Chemical National Bank, 126 bls. from Rotterdam; E. J. Keller Co., 1,172 bls. from Rotterdam and 1,069 bls. from Bremen; Daniel M. Hicks, Inc. 183 bls. from Havre; Parsons & Whittemore, 616 bls. from Hamburg; State Bank of New York, 25 bls. from Hamburg; P. Berlowitz, 106 bls. from Bremerhaven; Order, 5 bls. from London and 140 bls. from Bremerhaven.

Miscellaneous Paper Stock

Ladenburg, Thalman & Co., 527 bls. from Antwerp and 154 bls. from Copenhagen; Mechanics & Metals National Bank, 35 bls. from Antwerp, 40 bls. from Glasgow and 11 bls. from Dundee; American Express Co., 98 bls. from London; R. F. Downing & Co., 54 bls. from Manchester; E. J. Keller Co., 25 bls. from Glasgow and 31 bls. from Dundee; Brown Bros. & Co., 36 bls. from Liverpool; Irving National Bank, 63 bls. from Antwerp; Order, 219 bls. from Antwerp and 3 bls. from Manchester.

Paper

Importations of print paper in September were quite large, approximately 35,000 rolls of news print being received through the port of New York alone, which compares with about 24,000 rolls arriving at the same port in August. Imports of other kinds of paper last month were fairly heavy, there being numerous shipments received of cigarette, filter, hanging and wrapping papers and straw and paste boards. Arrivals at New York in September follow:

Cigarette

American Tobacco Co., 1,050 cs. from Bordeaux and 460 cs. from Havre; Surbrug Co., 40 cs. from Havre; Southern Pacific Co., 2 cs. from Havre; Rose & Frank Co., 67 cs. from Havre; Equitable Trust Co., 1,040 cs. from Bordeaux; United States Forwarding Co., 12 cs. from Hamburg; Order, 3 cs. from Kobe.

Printing

Equitable Trust Co., 1,659 rolls from Hamburg; Bedden & Martin, 2 cs. from Hamburg; A. Moltzan, 333 rolls from Christiania; H. Reeve Angell & Co., 972 rolls from Helsingfors and 1,826 rolls from Kotka; Irving National Bank, 98 rolls from Hamburg; Atlantic Forwarding Co., 8 rolls from Hamburg; B. F. Drakenfeld & Co., 15 cs. from Liverpool; National City Bank, 2,834 rolls from Hallstavik and 185 rolls from Hamburg; Chemical National Bank, 1,207 rolls from Norrkoping and 1,336 rolls from Hamburg; D. S. Walton & Co., 1,256 rolls from Norrkoping, 90 rolls from Hamburg and 2,318 rolls from Gothenburg; H. Lips, 240 cs. from Antwerp; National Park Bank, 109 rolls from Copenhagen; M. Gottesman & Co., 380 rolls from Gothenburg; Chase National Bank, 3,772 rolls from Hallstavik; E. C. Melby, 20 rolls from Christiania; Philadelphia National Bank, 45 rolls from Hamburg; Denison-Pratt Co., 238 rolls from Christiania; Globe Shipping Co., 180 cs. from Hamburg; Sun-Herald Corp., 1,870 rolls from Gothenburg; Poland Paper Co., 7 bls. from Gothenburg; Street & Smith Corp., 41 rolls from Christiania; Stone & Larsen Co., 275 rolls from Christiania; Miller & Wright Paper Co., 3 cs. from Rotterdam; J. J. Nolan, 10 rolls from Christiania; American Express Co., 381 rolls from Sundsvall; New York Tribune, 601 rolls from Christiania; W. F. Etherington & Sons, 11 cs. from Glasgow; C. Hardy & Ruperty, 52 rolls from Hamburg; L. A. Consmiller, 7 cs. from Hamburg; Parsons & Whittemore, 56 rolls from Rotterdam; Order, 1,093 rolls from Kotka, 10,294 rolls from Christiania, 865 rolls from Hamburg, 113 cs. from Antwerp, 4 cs. from London and 763 rolls from Sundsvall.

Wrapping

Philadelphia National Bank, 68 bls. from Hamburg; Ladenburg, Thalman & Co., 1,213 rolls from Hamburg; Cosmopolitan Shipping Co., 900 rolls from Rotterdam; Order, 91 rolls from Rotterdam and 39 pkgs. from Hamburg.

Hanging

A. C. Dodman, Jr., & Co., 10 cs. from Antwerp, 31 bls. from Liverpool and 2 cs. from Southampton; R. F. Lang, 320 bls.

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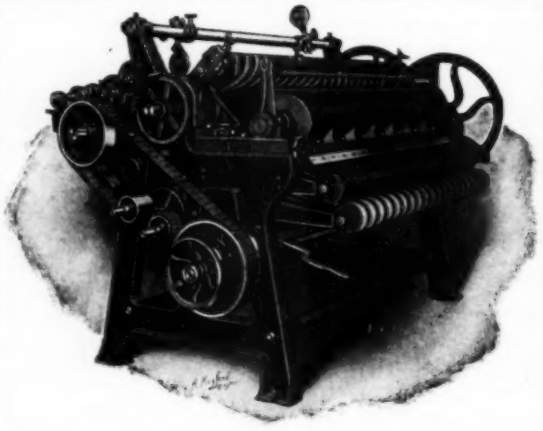

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Writing

L. E. Waterman & Co., 6 cs. from Havre; J. W. Hampton, Jr., & Co., 5 cs. from Hamburg; Goodman & Levy, 5 cs. from Paris; F. B. Vandegrift & Co., 6 cs. from London; Lunham & Moore, 8 cs. from Rotterdam; Van Oppen & Co., 7 cs. from Havre; Gimbel Bros., 4 cs. from Havre; Stern Shipping Corp., 5 cs. from Havre; Order, 2 cs. from Rotterdam.

Drawing

Lunham & Moore, 4 cs. from Bremerhaven and 6 cs. from Rotterdam; Keuffel & Esser Co., 79 cs. from Hamburg, 13 cs. from Rotterdam and 6 cs. from Liverpool; E. Dietzgen & Co., 4 cs. from Hamburg.

Filter

Lunham & Moore, 10 cs. from Bremerhaven and 8 cs. from Rotterdam; International Forwarding Co., 10 cs. from Hamburg; E. Fougera & Co., 85 cs. from Bordeaux; J. Manheimer, 105 bls. from Bordeaux; Transatlantic Shipping Co., 2 cs. from Hamburg; Zinkeisen & Co., 4 bls. from Hamburg; P. H. Petry & Co., 3 cs. from Gothenburg.

Tissue

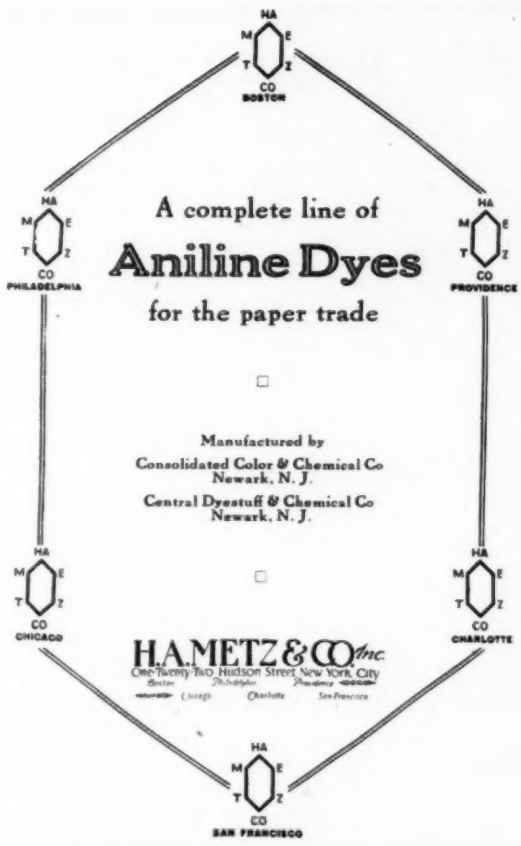
R. Hoe & Co., 4 cs. from London; Meadows, Wye & Co., 5 cs. from Liverpool; Wilkinson Bros. & Co., 11 bls. from Liverpool; F. R. Arnold & Co., 5 cs. from Southampton; G. W. Sheldon & Co., 2 cs. from Liverpool.

Boards

United States Forwarding Co., 8 cs. from Hamburg; H. Price, 5 cs. from Hamburg; Metropolitan Import & Mfg. Co., 90 cs. from Hamburg; Prager Co., 44 cs. from Hamburg; Eastern Calender Co., 25 cs. from Hamburg; Wiebusch Importing Co., 15 cs. from Hamburg; Riegel & Co., 28 rolls from Rotterdam; H. Reeve Angell & Co., 68 bls. from Hamburg; Phoenix Shipping Co., 21 cs. from Hamburg; Kuhne, Nachod & Kuhne, 25 cs. from Hamburg; Hermes Bros., 22 cs. from Hamburg; G. H. Goldenberg, 2 cs. from Hamburg; W. B. Wheeler Corp., 100 cs. from Hamburg; Bendix Paper Co., 13 cs. from Hamburg; Lagerloef Trading Co., 1,905 bls. from Helsingfors; C. B. Richard & Co., 51 cs. from Hamburg; T. L. Stern & Co., 2 cs. from Hamburg; Order, 27 cs. from Hamburg and 6 rolls from Rotterdam.

Miscellaneous

R. F. Downing & Co., 4 cs. from Hamburg; Stern Shipping Co., 10 cs. from Hamburg; P. H. Petry & Co., 12 cs. from Hamburg; E. Daiber, 3 cs. from Antwerp; Hensel, Bruckmann & Lorbacher, 5 cs. from Bremerhaven and 9 cs. from Hamburg; Kaufmann & Straus Co., 3 cs. from Hamburg; Rapid Addressing Machine Co., 6 cs. from Tokio; Van Oppen & Co., 2 cs. from Hamilton; Gimbel Bros., 5 cs. from Havre; A. H. Ringk & Co., 35 cs. from Hamburg; G. E. Stechert & Co., 3 bls. from Hamburg; Pitt & Scott, 45 cs. from Havre; American Express Co., 2 cs. from Bremerhaven; John Wanamaker, 15 cs. from Havre; A. Steinhardt & Bro., 6 cs. from Hamburg; Gallagher & Ascher, 22 cs. from Hamburg; Kern Commercial Co., 54 cs. from Rotterdam; Import Paper Co., 70 cs. from Rotterdam; Eastman Kodak Co., 6 bls. from Hamburg; Japan Paper Co., 29 cs. from Yokkaichi, 140 cs. from Genoa and 20 cs. from Havre; Merrymount Paper Co., 3 cs. from Naples; M. Brag, 17 cs. from Hamburg; Canson & Montgolfer, 7 cs. from Paris and 11 cs. from Havre; C. Moran & Co., 4 cs. from Paris; C. B. Richard & Co., 6 cs. from Hamburg; Happel & McAvoy, 4 cs. from Hamburg; Simplex Perforating Co., 18 bls. from Manchester; Reichard Coulston, Inc., 24 cs. from Hamburg; F. B. Vandergrift & Co., 3 cs. from Hamburg and 3 cs. from Liverpool; Lunham & Moore, 12 cs. from Rotterdam; Meadows, Wye & Co., 3 cs. from Southampton; American Shipping Co., 100 bls. from Genoa.



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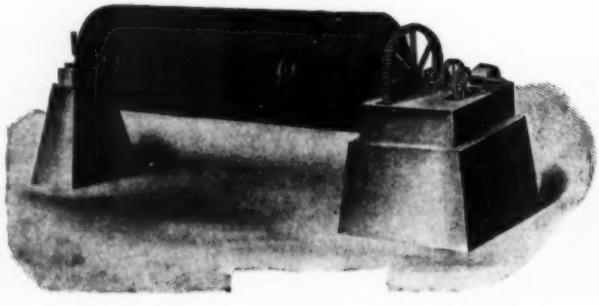

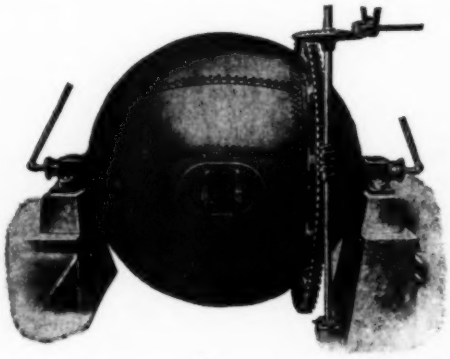

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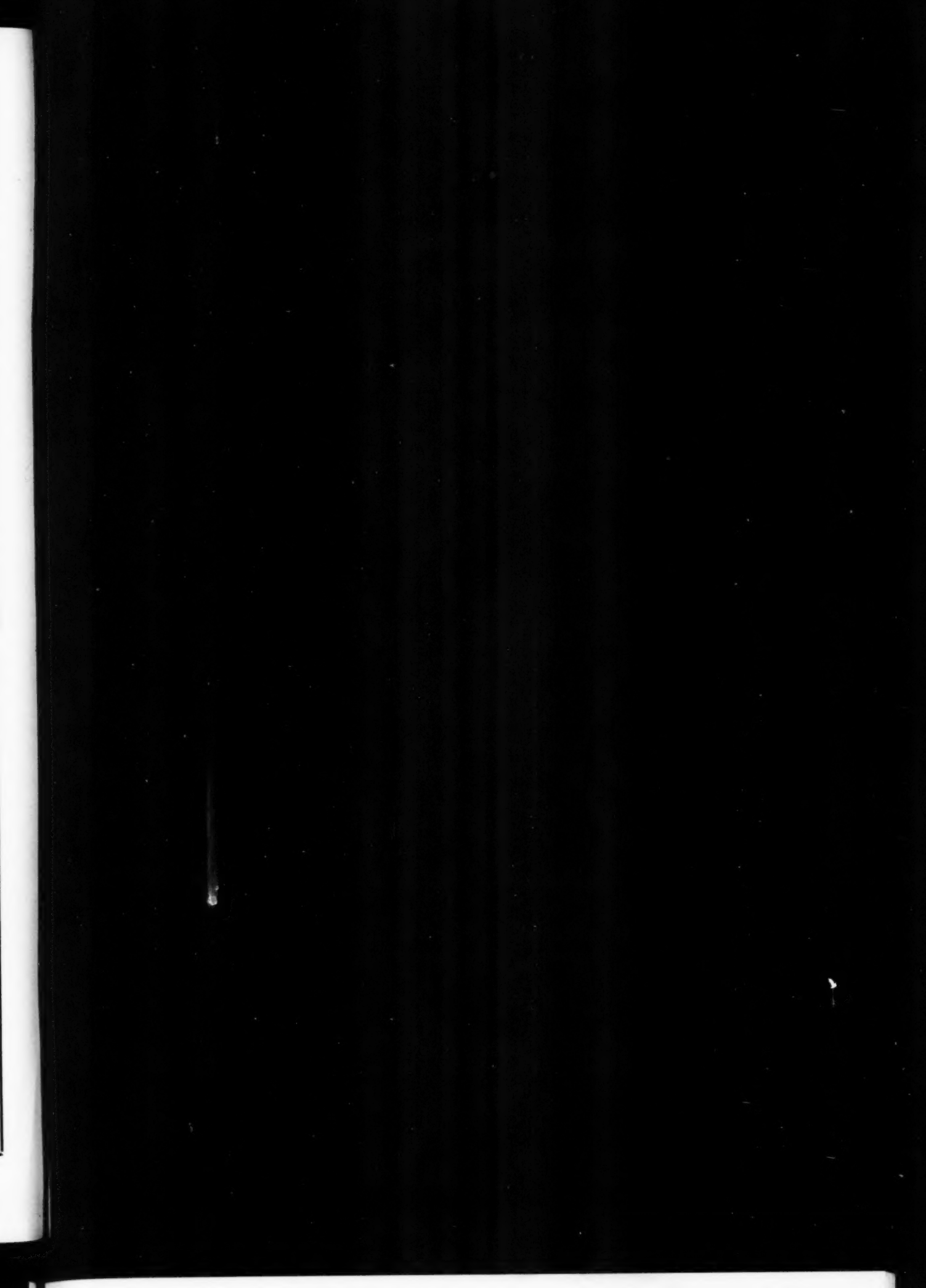
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